TEXTILES PAPER LEATHER

AMERICAN DYESTUFF REPORTER

Including the Proceedings of the
AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

VOLUME XIV FEBRUARY 9, 1925 NUMBER 2

GEIGY

To commemorate the advent, thru J. R. GEIGY S. A., of Erio Chrome Colors to the curriculum of wool dyeing.

These colors have enabled quick and simple application, and at the same time have given the permanency of shade so much sought for in woolens.

G

Selling Agents for
J. R. GEIGY S. A.
Basle, Switzerland

BRANCHES:
Boston Philadelphia
Providence Toronto
Columbus, Ga.

GEIGY COMPANY, Inc.
89-91 BARCLAY STREET
NEW YORK, N. Y.

In Great Britain:
THE GEIGY COLOUR CO., LTD.
35-37 Dickinson Street
Manchester

Branch Works at Clayton

Established 1764

Manufacturers of dyestuffs since 1859

Complete Dictionary of Chemical Products
THE KLIPSTEIN ORGANIZATION—in its relation to the Chemical Requisites of Industry, in general, constitutes a compendium wherefrom may be drawn a list of products almost unlimited as to range and application.
We Specialize in
TEXTILE CHEMICALS
COMPOUNDS and PREPARATIONS
for
Sizing—Softening—Finishing
DYESTUFFS and COLORS
Sodium Sulphide
Formaldehyde
Acetic Acid
Chrome Chloride
Bichromates
Oxalic Acid
GUMS—OILS—WAXES
A·KLIPSTEIN & CO.
644-52 Greenwich St.
NEW YORK CITY
Branches:
Boston Philadelphia Chicago Providence, R. I. Charlotte, N. C.
Represented in Canada by
A. KLIPSTEIN & CO., Ltd., 12 St. Peter Street, Montreal
AKO
TRADE MARK
"Get it from Klipstein"

American Dyestuff Reporter, Vol. XIV, No. 3. Feb. 9, 1925. Published twenty-two times a year by Howes Publishing Co., Inc., 90 William Street, New York, N. Y. Domestic subscription $5.00; Canadian, $5.50; foreign, $6.00. Entered as second-class matter Nov. 6, 1919, at the New York, N. Y., Post Office, under the Act of March 3, 1879. Copyrighted, 1925, by Howes Publishing Co.

BRANCH OFFICES:
BOSTON
PHILADELPHIA
CHICAGO

FACTORIES:
LOCK HAVEN, PA.
NYACK, N. Y.

Immediate Delivery

For the artificial silk piece and skein dyers

our new line of

AMANIL CHROME BROWNS

namely:

AMANIL CHROME BROWN G T
AMANIL CHROME BROWN R T
AMANIL CHROME BROWN 2 R T
AMANIL CHROME DARK BROWN T

These dyestuffs are of particular interest to the dyer because of their **level dyeing** and **evenly exhausting qualities,** good fastness to light, acids and calendering, and are well suited for the dyeing of cotton yarns, artificial silks, hosiery and cotton piece goods.

By aftertreating them with Bichromate of Soda or Potash and Sulphate of Copper, excellent fastness to light and washing is obtained.

Prices and samples gladly furnished upon request.

Do not fail to call on us with your dyeing problems.

American Aniline Products, Inc.

45 EAST 17th STREET :: NEW YORK, N. Y.

COMPLETE

Laboratory Service

For Textile Mills

Dyestuffs Tested for
Identity, Fastness, Strength.

Dyestuffs on
Dyed Materials Identified.

THE facilities of our excellently equipped laboratory, and the services of our experienced textile chemists are available to textile mills on the basis of a moderate annual fee covering all routine work, or for special work upon a standard scale of prices.

Our wide experience in dyestuff chemistry, our modern apparatus, and, in particular, our files of type samples of over 3,500 different varieties of dyestuffs, make possible a most superior service.

Complete information will be furnished on request.

TINC TURA Laboratories, Inc.

85 Fort Greene Place, Brooklyn, N. Y.

Grasselli Dyestuff Corporation

Plants:
Rensselaer, N. Y.
Grasselli, N. J.

Sole importers of colors manufactured by the

Farbenfabriken vorm. Friedr. Bayer & Co., Leverkusen

117 Hudson Street, New York

Boston—Providence—Philadelphia

Chicago—Charlotte—San Francisco

Sole Selling Agents:
Essex Aniline Works

AN AMERICAN PRODUCTION

OF REAL MERIT
For Those Who Can Appreciate
REAL WORTH

ALIZARINES BEAVER SULPHUR COLORS

ALIZARINE RED S POWDER

(SCHULTZ NO. 780)

WE GIVE SERVICE TO OUR TRADE

Has everything to recommend it. It is a home product, tested and proved.

Why not use it in preference to the foreign product?

THIS PRODUCT is made by BEAVER CHEM. CO.

DUNKER & PERKINS CO.

New England Agents
263 SUMMER ST., BOSTON

Indanthrene
Thio-Indigo
Helindon
Hydron
—and other vat dyes

Stock and Importations

direct from the manufacturers

A complete line of

Acid, Basic, Chrome, Sulphur and Direct Colors, Intermediates, Cotton Finishes, Turkey Red Oils, Soluble and Leather Oils

Manufactured by

Consolidated Color & Chemical Co.
Central Dyestuff & Chemical Co.
Williamsburg Chemical Co.
and other American manufacturers

H.A.METZ & CO. Inc.

122 Hudson Street, New York, N. Y.

128 Oliver St., Boston, Mass.
301½ West Trade St., Charlotte, N. C.
449 N. La Salle St., Chicago, Ill.
132 Chestnut St., Philadelphia, Pa.
316 Turk's Head Bldg., Providence, R. I.
20 Natoma St., San Francisco, Cal.

HA M E T Z CO

Reg. U. S. Pat. Off.

HA M E T Z CO

Reg. U. S. Pat. Off.

DIAX

Bleachers, Finishers and Dyers have complained that de-sizing compounds were expensive and hard to handle.

DIAX, made by the MALT-DIA-STASE CO., brought down the price and made its use easy.

DIAX, because it is better, is being used with great success by the larg-est Bleachers, Finishers, Printers and Dyers

Write us for Free Demonstration and Sample

MALT-DIASTASE COMPANY
79 Wall St., New York City

——LABORATORIES——
58-64 Garden Street Brooklyn, N. Y.
Wyckoff Avenue and Decatur Street Evergreen, N. Y.

ANTHROLIC ACID

Reg. U.S. & Can. Pat. Off.

More Lev.l Dyeings Brighter and Faster Shades
At a Lower Dyeing Cost

Chrome Mordants
Soluble Oils
Scouring Compounds
Chemicals for Textile Trade

ARKANSAS CO., Inc.
233 BROADWAY
NEW YORK CITY

1816 CHEMICALS *1925*

"Over a Century of Service and Progress"

BLEACHING POWDER
FINISHING MATERIALS
FORMIC ACID
COLORS
GUMS and WAXES
DYESTUFFS CAUSTIC SODA

INNIS, SPEIDEN & CO.

Manufacturers, Importers, Exporters of Industrial Chemicals

46 Cliff Street New York

BRANCHES:
Chicago Philadelphia Boston Cleveland
Gloversville, N. Y.

United States Color & Chemical Company, Inc.

93 Broad St. Boston, Mass.

New York Office: 25 Howard St.

FACTORIES:
NEW ENGLAND ANILINE WORKS, Inc.
Ashland, Mass.

GARFIELD ANILINE WORKS, Inc.
Garfield, N. J.

AMIDINE FAST BROWN DMB

equal to pre-war type of

DIAMINE FAST BROWN B

Good Fastness to Acid, Alkali, Light and Washing

Of Particular Advantage for Dyeing

Pile Fabrics, Drapes and Heavy Piece Goods

Write for Sample and Price

Manufactured by

JOHN CAMPBELL & COMPANY

75 Hudson Street — *American Dyestuff Manufacturers* — New York, N. Y.

BRANCHES

BOSTON CHICAGO PROVIDENCE CHARLOTTE PHILADELPHIA

"STANDARDS EVERYWHERE"

DYES

for

"Celanese" Brand Yarns, Fabrics, Etc.

"CR" (Celanese Resist) Cotton Colors

Dye Cotton and Artificial Silk

LEAVE CELANESE WHITE

"SRA" Colors

DYE CELANESE

Leave Cotton and Artificial Silk White

By use of "CR" and "SRA" dyestuffs any TWO COLORS can be obtained in ONE BATH on "Celanese" and Cotton or "Celanese" and Artificial Silk.

"CR" and "SRA" dyestuffs are made specifically for use with "Celanese" and are prepared and tested under expert supervision.

To meet the public demand for colors FAST to LIGHT and WASHING we offer "SRA" for DYEING CELANESE. Economical to use, they assure moderate cost in dyeing.

SAMPLES SENT ON APPLICATION

Authorized Distributors

AMERICAN-BRITISH CHEMICAL SUPPLIES, Inc.

Room 1505, 15 East 26th Street, New York City

Telephone, Madison Square 3312

"Celanese" is the registered trade-mark of the American Cellulose & Chemical Manufacturing Co., Ltd., 15 East 26th Street, New York, N. Y., for its yarns and fabrics, etc.

Every Buyer of Dyestuffs Should Own and Use

The 1924 Year Book

of the

American Association of Textile Chemists and Colorists

This volume contains carefully prepared tables of all American-made dyestuffs, grouped both alphabetically and by Schultz numbers. If you know the name of a color you can ascertain its maker and its classification. Under its proper Schultz number you will also find listed all similar competing products. It is a handy and reliable DYESTUFF BUYERS' GUIDE.

This Year Book also contains the Standard Methods of Determining the Fastness of Dyestuffs on Dyed Silk and Wool and Dyed and Printed Cotton. The tests are given for determining the fastness of dyes to laundry and mill washing, fulling, scouring and other agencies for each of these fibers. The methods of making the fastness tests on each kind of fiber for each class of fastness are described fully. The dyes and the washing and fulling formulas used in each test are given.

The book also includes the detailed reports of the Sub-Committees on Fastness to Perspiration and Fastness to Light and of the Research Committee—each of which contains technical material valuable to anyone concerned with the testing and application of dyestuffs.

Copies of this volume may be obtained at $3 per copy from the Secretary of the Association, Walter E. Hadley, 5 Mountain Ave., Maplewood, N J.

Established 1895

BOSSON & LANE

Manufacturers of

The Original

BLEACHING OIL

for boiling out Cotton, to produce a foundation for a Pure White

High Grade Sulphonated and Saponified

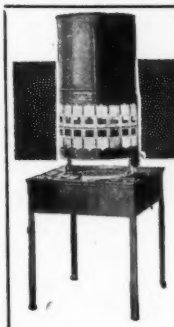
CASTOR OIL PRODUCTS

Para Soap Oil

Solvents and Assistants for cleaning all Textiles

B & L Bleachers' Bluings and Tints

Works and Office, ATLANTIC, MASS.



Will it Fade? Ask the

FADE-OMETER

Standardized Sunlight

The Boss Dyer

is held responsible for the quality of your dyeings. Doesn't it seem fair that he should be provided with the necessary equipment to do good work?

THE FADE-OMETER

is helping hundreds of firms all over the world to improve the quality of their goods and, at the same time, save money in their dyestuff purchases. Bulletin No. 60 tells how. It's free for the asking

Atlas Electric Devices Co.

364 W. Superior St. Chicago, Illinois

New York
F. SCHLAYER
25 Howard Street

London
A. D. LANG, LTD.
42, Berners Street, W-1

WHEN COLUMBUS WENT BACK

Among the many strange products which Columbus exhibited before King Ferdinand and Queen Isabella when he returned to Spain were a few samples of Logwood. "These are products of the Orient," he said, "proof of the wealth in the new land I have discovered."

LOGWOOD

through its extensive use as a black dye for the past 400 years has become an important product of the once supposed Eastern lands—the West Indies.

To-day dyers are obtaining their best black results with Logwood. In beauty of shade, depth, richness and permanency it remains unequaled.

American Dyewood Company Logwood is manufactured in extracts, crystals and Hematine paste. You can obtain it in the form which best suits your facilities. Write for prices.

AMERICAN DYEWOOD COMPANY

AMERICAN DYEWOOD COMPANY

NEW YORK BOSTON PHILADELPHIA HAMILTON, ONT.
Works at CHESTER, PA.

Manufacturers of Amdyco, the new foam stabilizer for fire prevention.

Time Proves All Things

FROM the Pyramids of the Pharaohs to the sky-scrapers of New York,—from Fulton's Claremont to the Leviathan ploughing her majestic way across the waters,—TIME has been the final arbiter.

Time can be our greatest enemy or our greatest friend. It can shatter our claims, or prove them up to the hilt. It can point the way to increased profits, or show us how to avoid loss.

Fifty years of constant, unremitting grind have served to demonstrate the enduring profit-producing quality and dependability built into

KLAUDER-WELDON
Dyeing - Bleaching - Scouring
MACHINES

If you care to write, we'll be glad to give you details of machines that, *after nearly fifty years* of service, are *still operating* economically.

And, upon request, a representative will gladly discuss with you your present or future dyeing problems or requirements.

Special Construction When Required

KLAUDER-WELDON DYEING MACHINE CO.
Originators, Pioneers and Leaders
Bethayres, Pa.

Specialization

Building extractors, and extractors only, has produced

The TOLHURST

—the one machine that definitely answers every requirement of the textile industry.

Lower Operating Cost
Larger Loads
Safety

TOLHURST
REG. U.S. PAT. OFF.
CENTRIFUGAL
EXTRACTORS
TOLHURST MACHINE WORKS ESTABLISHED 1852. TROY, N.Y.

Röhm & Haas Company, Inc.

We have specialized in the manufacture of
Hydrosulfites
and Allied Products

Lykopon—Anhydrous Sodium Hydrosulfite for reducing indigo and vat dyes, for stripping, etc.

Formopon—Sodium Formaldehyde Sulfoxylate for discharge printing.

Indopon W—Indigo Discharge Assistant.

Formopon Extra—Basic Zinc Formaldehyde Sulfoxylate for stripping dyes.

Protolin—Soluble normal Zinc Formaldehyde Sulfoxylate for stripping dyes.

Protolin AZ—A special soluble Sulfoxylate for stripping dyes.

Our laboratory makes a special study of these products and their application, and appreciates the opportunity of co-operating with users in solving any problems which the employment of these products presents. Suggestions for stripping dyes from all classes of goods are supplied on request.

We also manufacture in our own plants a wide range of Heavy Chemicals, including Acids, Sodium Sulfide, Glauber's Salt, Aluminum Sulfate, Aluminum Chloride, liquid and crystals, Tartar Emetic, etc.

Office
40 North Front Street
PHILADELPHIA

Factories
Bristol and Bridesburg, Penna.
Branches
Chicago, Ill. Gloversville, N.Y.
Boston, Mass.

Contents of This Issue

February 9, 1925

Caustic for Mercerizing and Its Recovery.. 71
Charles F. Goldthwait

The Preparation of Ice Colors for Direct Printing 75
Anton Gotthardt

Summary of Dye Imports for 1924..... 77

List of Vat Dyes with Strength Ratios Between Paste and Powder..... 78

Proceedings of the American Association of Textile Chemists and Colorists:
January Meeting of Rhode Island Section. 79

Address of Professor Olney..... 79

Zinc Ferrocyanide as a Mordant—*A Paper* by Stewart F. Carter..... 80

January Meeting of the New York Section 82

The Dyeing and Finishing of Leather.. 82
Dr. Allen Rogers

Discussion of Above Paper..... 86

Communication: The Sub-Committee on Light Fastness 87

Communication from the President..... 88

Applicants for Membership..... 89

Changes of Address 89

Withdrawn 90

Editorials:

Domestic Competition and Dyestuff Prices 91

Concerning "Fastness Guarantees"..... 91

Practical Hints on the Production of Bright Colors on Textile Fabrics—Part IX... 93
Raffaele Sansone

Dyestuff Tables 96

Technical Notes from Foreign Sources..... 98

Recent Patents 102

Trade Items 103

BLEACHERS!

Send to your Selling Agent samples of

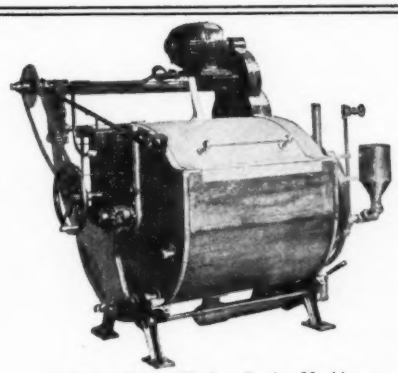
Sol-Ozone bleached goods—cottons, woolens, silks—

He will be pleased to see goods improved, as to

Strength and Durability,
Stability of color,

Softness and Elasticity,
free from smells and chemicals.

THE ROESSLER & HASSLACHER CHEMICAL CO.
709 Sixth Ave. New York City



American Rotary Hosiery Dyeing Machine

Simplification of hosiery dyeing is only one of the many advantages for the user of American machines. The machine does the dyeing and does it automatically. Large and small users show interesting savings made possible by the machines. Write for bulletins.

The American Laundry Machinery Co.
Specialty Dept. B
CINCINNATI, OHIO

The AMERICAN ROTARY HOSIERY DYEING MACHINE

For the Expert Dyer

The wide experience of National's staff of technical men, who are specialists in the various methods of dye application, will materially assist the solution of unusual problems which frequently confront every expert dyer.

This is the service National offers at each Branch Office — expert technical assistance, immediately available.

National Aniline & Chemical Company, Inc.
40 Rector Street, New York, N. Y.

Boston	**Philadelphia**	**San Francisco**
Providence	**Chicago**	**Montreal**
Hartford	**Charlotte**	**Toronto**

NATIONAL DYES

AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Devoted to the practical application of dyestuffs in all industries; especially to textile chemistry—the science and practice of scouring, bleaching, dyeing and finishing.

VOLUME XIV NEW YORK, FEBRUARY 9, 1925 NUMBER 2

Caustic for Mercerizing and Its Recovery

Proper Choice Affects Cost and Quality of Work—Methods of Dissolving and Buying in Solution—The Simpler Methods of Recovery—Recovery by Evaporators

By CHARLES F. GOLDTHWAIT

THE cost of caustic soda is the big item in the cost of mercerizing. The proper choice of caustic affects both the cost of the operation and the quality of the work. Everybody seems to agree that caustic should be as pure as possible—but nobody seems to have proved it, and certainly a great deal of commercial mercerizing has been done with very ordinary caustic.

However, there seems to be little argument that the purest commercial caustic is best for the process, and it can be seen from the analysis quoted that there is really quite a difference between the commercial grades of solid caustic.

A more recent development for the larger user is liquid caustic soda in tank cars. This is one of the things that the wise purchasing agent will condemn at sight because he won't pay freight on all that water. However, that is not the whole story and some careful figuring is necessary. The argument for its use is that a great many items of manufacturing and handling costs are saved. The largest is cost of evaporation, for all caustic as made contains about 75 per cent of water. Then there is the cost of the steel drums as well as labor in filling, handling and loading. The consumer saves labor costs of unloading, opening and disposing of drums and redissolving the caustic. The liquid caustic is also purer.

Disadvantages of the liquid are the freight on the extra weight, and the necessity for special storage tanks and for a little extra pumping.

Considering that one who buys solid caustic has to pay for taking all the water out of it anyway, and that the first thing done at the mill is to put the water back in, it will be evident that the thing to do is to figure the actual cost per pound of pure caustic, add the freight on the same basis, then buy the one that is best, allowing a little, if justifiable, for convenience and other advantages.

The liquid caustic is put up in regular solutions of 25 per cent, 32.5 per cent and 38 per cent, or other strengths on specification. The first is called non-freezing solution, and its saturation temperature or crystallizing point is 1.4 deg. Fahr. The corresponding figure for the 32.5 per cent is 24.8 deg. Fahr., and for the other strengths still higher, so their use is somewhat limited where transportation is necessary in cold weather.

Caustic Strength

The proper strength of the caustic solution to purchase will depend also on the price and freight rate, and still more on the exact purpose to which it is to be put. The 25 per cent is also exactly the usual strength used in yarn mercerizing, and so it would not do for strengthening liquors that have become weakened through use. It might answer requirements for piece mercerizing where operating strengths sometimes run as low as 15 per cent. On general principles and for most plants, one of the stronger solutions should be bought, unless there is a recovery system, and it is found best to depend on it for the strong caustic. It is much more convenient to operate if there is a strong solution to draw on.

Comparative analyses of several commercial grades by the same manufacturer are given, the figures for liquid caustic referring only to the solid content of the solution:

		Commercial Grades		
	Liquid	78%	76%	74%
Sodium hydroxide...	over 99	98.7	96.9	94.43
Sodium oxide (actual)		77.	76.07	74.02
Sodium oxide (N. Y. and L.)		79.5	78.52	76.41
Sodium carbonate....	below .5	1.1	1.66	1.85
Sodium chloride.....	below .07	.13	.84	2.43
Other impurities.....		.07	.60	1.29

Assuming that solid caustic is bought, such a simple matter as dissolving it has its trials. Probably the worst method ever invented is dumping several whole cakes, full drum size, into the bottom of a tank, running in weakened mercerizing caustic as a solvent and turning on more or

less steam. There is quite a choice of things that can happen and usually some of them do. The liquor gets too hot and boils over; it gets too much water from condensed steam; it melts down and hardens in the bottom and closes off the outlet pipe; or it gets thick and syrupy at the bottom on cooling and will not pump.

A scheme that is getting to be more common and works much better is to put a structural steel grating in the tank so that it will hold the cakes up in the top, but just under the surface. Even without the use of steam there is an automatic mixing from the heavier liquid settling away from the caustic and being replaced by lighter liquid of a lower concentration.

There are also good and bad ways of getting the caustic to the mercerizing machine. Perhaps an example of the worst is letting it run at high strength into one corner of a skein yarn mercerizing machine, and trusting to luck that it gets mixed. An example of a very efficient way is the warp mercerizing range where the caustic circulates continuously from a tank at standard strength, through the several compartments of the machine back to the supply tank.

Since mercerized cotton in its final state does not contain either caustic soda or sodium derived from it, it is evident that the entire amount used is either neutralized or passes off in the wash waters, for it does not undergo any permanent change in the process itself.

Except for the small amount of the alkali that is actually lost by being carried into the acid neutralizing bath, it is all theoretically subject to recovery.

The Recovery of Caustic

There are two reasons for the recovery of such caustic soda. The first is to economize, and the second, less frequently encountered, is to avoid polluting river waters. It is said that objections to stream pollution raised by European health authorities led to the very first caustic, so this is another example of a nuisance becoming a very valuable product.

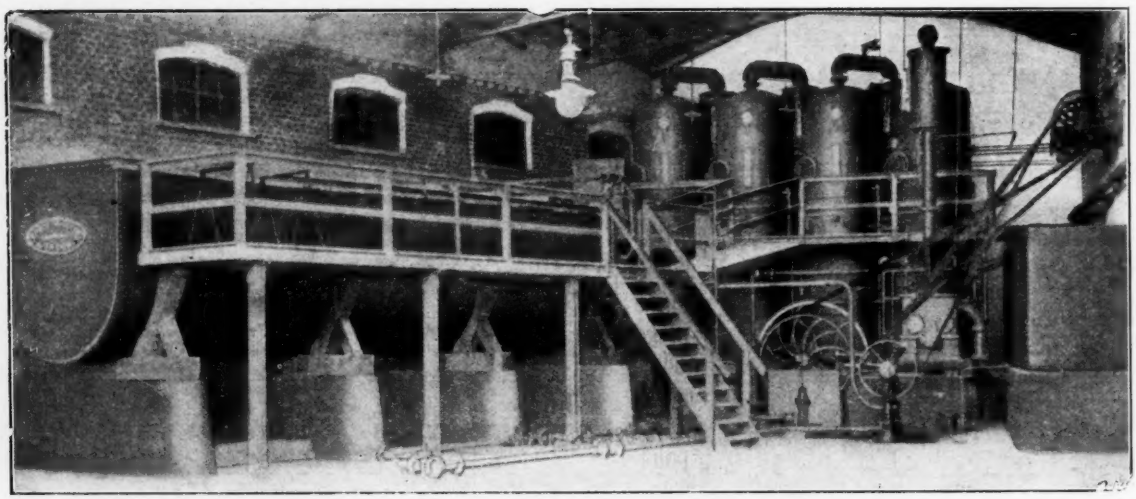
In trying to cover this subject in a general way, the main difficulty is that conditions will vary greatly in different plants, and it is usually necessary to make a statement or mental reservation to that effect, although it does not add to positiveness of diction. While a simple scheme for such recovery may be in effect in one plant, a somewhat different arrangement is likely to be found in the next. Ranges or averages are frequently necessary, for there are no definite figures of general application.

The first essential is to get the wash waters from the process at as great a concentration as possible consistent with proper washing. This is done by using the countercurrent system, so familiar in chemical engineering.

Probably without exception any caustic recovery system, that can be called a system, or that has been designed at all, starts with some scheme of washing which moves the water by a series of compartments, series of sprays, or something equivalent, in a contrary direction to the goods. In this way the goods are passing through cleaner and cleaner wash waters, while the water keeps coming in contact with goods containing more and more caustic and therefore keeps getting stronger. The system is applied very readily to mercerizing ranges for pieces or to warp mercerizing machines.

The simplest recovery is possible in a plant doing relatively little mercerizing, but a large amount of kier-boiling or bleaching. The dilute caustic solution is simply pumped to a stock tank and then used, with proper additions, in making up kier liquors. Such use is far cheaper than evaporating back to mercerizing strength. In fact, the recovery costs almost nothing except for a little extra power for pumping and overhead on a little equipment.

Another of the less complicated and less expensive methods of utilizing waste caustic is by the absorption of chlorine and the use of it for bleach. There is little information, however, available. Schroeder[1], in an article that features the use of liquid chlorine rather than the recovery of caustic, states that one of the earlier methods was to add enough soda ash to 4 deg. to 6 deg. Tw. caustic



Courtesy Ernest Scott & Co.

Quadruple-Effect Evaporator with Causticizer

to bring it up to 10 deg. Tw. and then run in the chlorine, the soda being required to insure proper stability.

The development of automatic control has, however, made it possible to mix directly and continuously without the use of soda ash. A neutral bleach can be made; an alkaline bleach, if necessary for storing; or a slightly acid bleach for more rapid action.

At one plant 500 gallons of bleach per hour is obtained from 4 deg. Tw. mercerizing waste liquors, and at a strength of 1.25 to 1.5 per cent available chlorine.

Theoretically one pound of chlorine will combine with 1.15 pounds of sodium hydroxide. If the caustic is contaminated with organic matter, there will be some action by the chlorine and a corresponding loss. Ordinarily this would be slight.

Novel Recovery Methods

Several odd methods for the recovery of caustic have been suggested by European writers. They might have some economic justification in Europe, but do not look very practical for American use. They are mentioned briefly for their novelty.

One suggestion is to neutralize the caustic washings with hydrochloric acid, and then electrolyze the resulting brine back to caustic. In such a case the souring could be done with hydrochloric acid and the washings used for the neutralizing.

Another idea is to carbonate all the caustic soda in the goods after it has done its work, by putting through a "gassing" chamber, then rinsing it out and using it as soda ash. Advantages claimed are that the goods would not have to be soured, and that the necessary carbonic acid gas could be obtained from the mill smokestack.

A German patent of 1907 suggests running the wash water to a steam boiler where it will be continually evaporating the water, with accumulated caustic to be circulated through the mercerizing system, and the steam, which would react alkaline, to be used for kier boiling. Apparently, however, the idea was more ingenious than practical.

The more complicated and expensive systems of recovery designed for use in the larger plants involve collecting the caustic as already outlined, filtering if necessary, causticizing in some cases, and evaporating to a stock solution of strength that can be used to replenish caustic that has become weakened by use. The amount of caustic not recoverable in some simpler way and the cost of steam determine whether such a system can be profitably installed. With cheap exhaust steam, 750 pounds of solid caustic per day is about the lower limit, while if it is necessary to use live steam the lowest that will pay is about 1,000 pounds. Owing to the expense of supervision, and other items being but little higher for large plants, they are much more profitable.

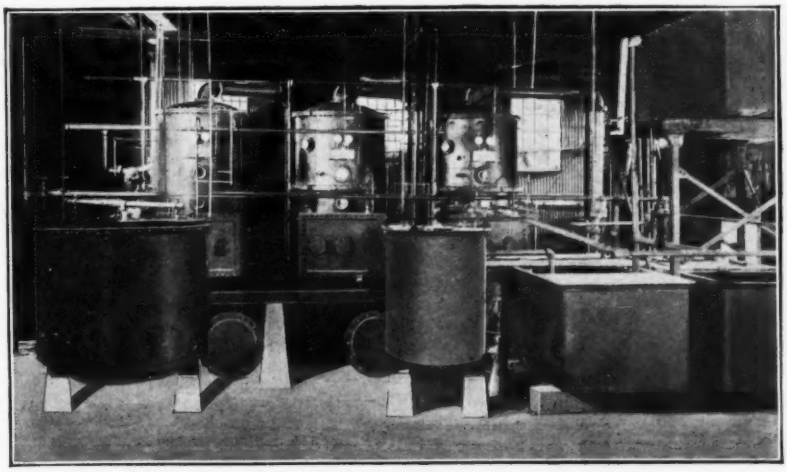
Washings as low as 2 per cent caustic strength can be recovered to advantage, but this is partly a matter of the cost of steam. There is no need of their being as low as that. In most cases the best strength is from 5 deg. to 8 deg. Tw. The washing can be readily done and the weak caustic solution is of reasonable strength for treatment. Strengths as high as 12 deg. Tw., if not more, can sometimes be obtained, and are advantageous from the recovery point of view, although not always from the standpoint of washing.

The operations preliminary to evaporating depend on the circumstances. The simplest is filtration only, and is necessary where caustic solutions are utilized over and over again. Coke filters are frequently used. Coke crushed to pea size is good for strong solution; rice size is better for the dilute solutions. These filter beds can be supported on perforated iron plates.

Causticizing

The question of causticizing is another that is not very positive and definite. Sodium carbonate occurs in all new caustic that is introduced in the system, and there is some carbonating action on the caustic from exposure to the air during the process. However, carbonate does not always accumulate to an objectionable extent in mercerizing and recovery systems. Four per cent is the highest noted, while that in the original caustic may be as high as 2 per cent.

On the other hand, in such a case as the mercerizing of gray pieces there would be a serious accumulation of foreign matter in the caustic; a causticizing treatment with lime is the simplest way to get rid of it, and at the same time recover a little more caustic. The larger part of the impurities is thrown down and can be filtered out. Some impurities that do not come down at once separate out later on concentrating. Sometimes an additional coagulent like lead acetate is used to hasten the settling.



Courtesy Zaremba Co.

Caustic Recovery Plant

The idea of causticizing suggests at once that a large enough equipment might be used so that all the caustic required by the mercerizing plant, in addition to that recovered, can be made by causticizing soda ash. This, however, would not pay, unless operating on 8 or 10 tons of new caustic a day. The present tendency is away from causticizing.

An unknown writer says: "These impurities can be precipitated and removed by adding about 20 to 40 pounds sulphate of lime to each 100 gallons of waste liquor at 8 deg. to 10 deg. Tw. This sulphate can be used over and over again indefinitely by heating it between the acts and burning the impurities out of it."

Cost of Recovery and Equipment

Claims for profitable recovery run as high as 96 per cent. Most plants, however, operate within the range of 80 to 90 per cent of the caustic entering the mercerizing process. The cost per pound will go up and finally overbalance the value of the extra pounds if the recovery is carried too far.

Caustic recovery in a textile plant is a chemical manufacturing operation, carried out in an unusual place. At a certain stage in the process, the caustic manufacturer obtains caustic soda in solution and must evaporate it to dryness, to sell it in the solid form. This means that he had had to supply the material and now has to evaporate the water.

In the textile mill the material is, in a sense, free, because it has already been charged into process. If the chemical man can make a profit, it appears superficially as though the mill man should go much better, especially as he does not have to carry evaporation as far.

However, it is not so simple, and even where there is volume enough to carry the expense of proper supervision, very careful study must be made of concentrations and other factors entering into the problem. It is a problem for the chemical engineer experienced in this particular line.

The cost of recovery is not by any means a constant definite amount. It should run around 1 to 1 1/3 cents per pound, or roughly a third of the price of solid caustic. After paying the direct expenses it should show a very satisfactory return on the investment.

A relative idea of the cost of plant and of steam can best be given by quoting from a letter from the Zaremba Company:

"We will state the cost of complete plants, including building, foundations, piping, erection, etc., on the unit basis of one pound caustic recovered per hour from a solution carrying 2.8 per cent caustic, the concentrated and purified solution carrying 32 per cent caustic. For small plants ranging in capacity from 100 to 150 pounds caustic per hour, this cost will be $100; for larger plants of 400 to 600 pounds hourly capacity, the cost will be $60.

"Some plants require 18 to 20 pounds steam per pound of caustic recovered; large plants require 9 to 10 pounds steam per pound recovered."

Acknowledgment and References

The writer desires to acknowledge assistance from the Zaremba Company, Ernest Scott & Co. and the Electro Bleaching Gas Company.

[1] Useful references are C. M. Edward Schroeder in Chemical and Metallurgical Engineering, 24, 925, "The Control of Chlorine in the Bleaching of Cotton Goods," and Winn W. Chase, in Textile World, August 30, 1924, "Caustic Supply and Recovery in Mercerizing."

NEW FINISH FOR COTTON THREADS

If cotton is treated with highly concentrated nitric acid in the presence of products formed by the action of nitric acid on cellulose, starch or protein, a shrinking of the fabric takes place, but at the same time a crimping and roughening of the threads occur. The fabric so treated resembles in appearance and feeling more a woolen fabric than a cotton one. This new process, which was discovered by Ch. Schwartz, produces a new form of finish to the cotton threads. According to information from Dr. Beil concerning this new process, which is called "philanizing," the threads so treated show a greater affinity for dyes, as is the case with mercerized threads. Aside from the more beautiful appearance and the softer feeling of philanized threads, they are more durable.

It is true that philanizing offers many difficulties in practice, as one must work with highly concentrated nitric acid, so that it can only be carried out in chemical plants. The Hochster dye works, with their enormous plant for the production of nitric acid, have been operating the process for several months. The philanized material is then finished in the textile finishing works, the dye works and the print works. Colored fabric which is dyed with indanthrene and other vat dyes, as well as yarn, loose cotton or roving, can be philanized. It is thought that new article of this material will be put on the market which will occupy a place between the cheap cotton and the expensive wool. —Industrial and Engineering Chemistry, November, 1924.

LEONIL S

Farbwerke-Hoechst announce in a recently issued booklet the production of a neutral salt known as Leonil S, described as soluble in water and acid, and as of considerable advantage in wool carbonizing. The product also possesses the property of tanning the wool to a certain extent, thus protecting it against the deleterious influence of dyeing, milling and finishing. The booklet describes the various uses of Leonil S and its application in the carbonizing and dyeing of woolen goods. Leonil S is marketed here by H. A. Metz & Co.

The Preparation of Ice Colors for Direct Printing

The Methods Employed in the Preparation of Ice Colors with Useful Data on the Ingredients Used and Complete Formulas for Various Colors

By ANTON GOTTHARDT

(Translated by Ismar Ginsberg, B. Sc., Chem. Eng.)

THE preparation of the ice colors for direct printing may be carried out in a variety of different ways. In most dyeing plants the methods employed for this purpose are much or entirely different from those used in other establishments. Furthermore, it is generally found that one or the other of these methods will give better results according to the practice that is acquired in its application, and hence it is hard to find two dyeing mills that use the same method in preparing the ice colors for use. It is, however, not at all certain that in any individual case the method that is being used at the present time is the best and most expeditious and most advantageous.

The method that is probably used most is the one that was first developed. In this method a thickened diazo solution is employed. This thickening solution is prepared just before use by adding the diazo solution to a composition of the thickening agent containing as well a definite amount of sodium acetate. The thickening agent that is most suited for this purpose is undoubtedly a good grade of gum tragacanth mucilage. But as this preparation is quite expensive, it is commonly mixed with other, cheaper, thickening agents in order to reduce the cost. These cheapening agents are commonly tapioca flour, wheat flour, wheat or corn starches, and in rare cases rubber and British gum.

Nevertheless all the printing color pastes that are made with diazo solutions possess one great disadvantage, namely, that they are very unstable. They cannot be kept for any length of time. Furthermore, in printing the fabric it is found that they become quickly contaminated with the other colors employed in decorating the fabric. Hence, the printer must be constantly cleaning the printing rolls and the color box renewing the color paste therein.

Loss of Color

According to practical experience about 30 per cent of these color pastes, instead of being put to use in printing the fabrics, actually go to waste without performing any useful work at all. It is possible, however, to obtain a color paste which possesses considerably greater lasting qualities and which permits a far more efficacious use to be made of the ice colors, particularly when Para Red is being employed, by working with the compositions given below and diazotizing the thickened paste.

The first formula which is well suited for printing with Para Red is as follows:

Primary Color Composition

Ingredients	For Body Color	For Decorative Effect
Tragacanth, 100 parts in 1,000.	800.0 c.c.	750.0 c.c.
Oxalic acid	15.0 gms.	18.7 gms.
Water, hot	71.5 gms.	89.6 gms.
Paranitraniline Red	27.5 gms.	34.3 gms.
Hydrochloric acid, 19 deg. Be..	24.5 gms.	30.6 gms.
Denatured alcohol, 95 per cent.	60.5 gms.	76.8 gms.
	1,000 gms.	1,000 gms.

The oxalic acid is dissolved in the hot water and the gum tragacanth mucilage added. The dyestuff Paranitraniline Red, hydrochloric acid and alcohol are made into a homogeneous solution by heating in a stoneware pot on a water bath and then, when a perfectly clear solution is obtained, the latter is added to the tragacanth thickening preparation. This mixture can be kept for weeks without any deterioration or spoiling, and hence it is possible to make the color paste in large amounts to last for a definite period of time.

When the color paste is made in large quantities, it is advisable in order to make sure that a thorough, homogeneous mixture is secured, to pass the paste through a hundred-mesh screen.

The composition of the finished color paste ready for use is seen from the following tabulation which gives the various ingredients for the various purposes to which the color paste is applied.

Para Red	For Body Color	For Decorating Effects
Primary color composition for body color	1,000 c.c.	
Primary color composition for decorative effects....		1,000 c.c.
Primary color composition for ice	100 gms.	100 gms.
Primary color composition for sodium nitrite.....	14 gms.	18 gms.
Primary color composition for water	50 c.c.	60 c.c.

The ice which is first washed off is added to the primary color or basic composition, and then a small portion of the nitrite solution is added with constant stirring. This is continued until all of the sodium nitrite solution has been added. After the diazotization of the color has been completed, the paste is made up, a piece of ice is added, and then the printing of the textile fabric can be proceeded with. Ice Red, which is prepared in this manner, can last for hours; it is very resistant to the other colors with which it comes in contact and does not run with them. Furthermore, the color bath does not have to be renewed so often, and particularly when large masses of it are being used the entire contents of the color bath can be consumed without any or very little waste of coloring matter. In order to avoid foaming of the paste, which sometimes takes place, it has been found advisable to add a little turpentine to the color bath.

A simpler formula which it is claimed gives results as good as those described above is shown in the following:

FOR PARA RED

Primary Color

875.0 grams of tragacanth, 100 to 1,000.
27.5 grams of Paranitraniline Red.
28.8 grams of cold water.
68.7 grams of hydrochloric acid, 21 deg. Be.

1,000.0 grams in all.

Para Red for Printing

1,000.0 grams of the primary color.
125.0 grams of ice.
16.5 grams of sodium nitrite.
50.0 grams of water, added before printing.
50.0 grams of crystallized sodium acetate.

The Paranitraniline dye is made up into a paste with the water and then the tragacanth solution is added; thereafter the solution of hydrochloric acid is mixed with the above. The remainder of the procedure is the same as that which has been described above. For decorative effects the percentage of the primary color used may be increased from 20 to 25 per cent, and under these conditions the consumption of sodium nitrite in the diazotization of the color is increased.

This Ice Red, made in accordance with the above specifications, has also been found to be very stable, although not to the same degree as the one described in the earlier part of this article. If the grade of gum tragacanth used in making up the compositions described above is of finer comminution, which is often the case, it is possible when the gum is allowed to stand for a long period of time to neutralize it with the aid of a weak solution of sodium hydroxide.

Still other types of ice colors may be prepared in the same or similar manner; and in these cases as well the lasting qualities of the preparations, the ease and certainty of their preparation, and the clearness of the printing designs are far superior to results with the ice colors obtained by the aid of thickened diazo solutions.

Following are a number of examples of such compositions:

Ice Bordeaux

280.0 grams of neutralized starch, tragacanth thickening mixture.
560.0 grams of the paste.
85.0 grams of ice.
8.0 grams of sodium nitrite.
27.5 grams of water; after diazotization add
39.5 grams of sodium acetate.

1,000.0 grams in all.

Paste

572.0 grams of neutralized starch tragacanth thickening preparation.
36.0 grams of alpha naphthylamine common grade.
293.0 grams of water.
99.0 grams of hydrochloric acid, 19 deg. Be.

1,000.0 grams.

Ice Orange

600.0 grams of neutralized starch, gum tragacanth thickening preparation.
24.0 grams of metanitraniline.
27.0 grams of oxalic acid.
206.5 grams of water.
100.0 grams of ice.
12.0 grams of sodium nitrite.
30.0 grams of water.
Add before printing
30.0 grams of crystallized sodium acetate.

Ice Pucelle

1,000.0 grams of the primary color.
100.0 grams of ice.
16.0 grams of sodium nitrite.
50.0 grams of water.

Primary Color for Pucelle

700.0 grams of neutralized starch, gum tragacanth thickening preparation.
24.7 grams of benzidine base.
42.0 grams of oxalic acid.
233.3 grams of water.

1,000.0 grams in all.

Ice Pucelle

550.0 grams of neutralized starch, gum tragacanth thickening preparation.
22.0 grams of polidine base.
21.0 grams of hydrochloric acid, 19 deg. Be.
25.0 grams of oxalic acid.
142.0 grams of water.
100.0 grams of ice.

15.0 grams of sodium nitrite.
50.0 grams of water.
Before printing
75.0 grams of crystallized sodium acetate.

1,000.0 grams.

The colors are printed, as usual, on goods that have been subjected to immersion in a naphthol bath, and are then finished in the usual manner. It is well to wash the good at once in cold water so as to stop the injurious action of oxalic acid which is contained in the aforegoing preparations.

To complete the data that has been given in this article the following formula has been given and represents a preparation that has been used with success for bottoming the fabric:

Naphthol Bottom for Printing

25 grams of Naphthol AR.
24 c.c. of lye, 36 deg. Be.
200 c.c. of hot water.
4 grams of tartar emetic.
5 grams of glycerine.
50 grams of water.
25 c.c. of sodium ricinoleate, one to one solution.
Sufficient water is added to make 1 liter of solution.

Summary of Dye Imports for 1924

Compiled by U. S. Department of Commerce in Collaboration with the Tariff Commission

The imports of synthetic dyes during 1924 (preliminary figures) were 2,825,990 pounds, with a value of $2,830,698. This represents a decrease of 272,203 pounds and $320,665 from that of 1923. The following table shows the imports of coal-tar dyes for 1924 and for the years 1920 to 1923, together with the imports for the fiscal year 1914. The quantity for the fiscal year 1914 was taken from Department of Commerce Special Agent Series 121, and the value from Commerce and Navigation. The figures for the years 1920 to 1923, inclusive, were taken from the Annual Census of Dyes and Other Synthetic Organic Chemicals, published by the United States Tariff Commission. The final figures for the dye imports of 1924 will be published in the Census of Dyes and Other Synthetic Organic Chemicals for that year.

Year	Pounds	Value
1924*	2,825,990	$2,830,698
1923	3,098,193	3,151,363
1922	3,982,631	5,243,257
1921	4,252,911	5,156,779
1920	3,402,582	5,763,437
1914	45,950,895	9,502,714

*Preliminary figures.

The table below contains the dyes of each class according to method of application imported in the largest quantity during 1924. The seventy-four dyes contained in this table comprised 62 per cent of the imports during the year.

Acids Dyes

Schultz No.	Class and Name of Dye	Quantity (pounds)
523	Fast Green	30,721
506	Erioglaucine	28,336
543	Patent Blue	23,606
22	Xylene Light Yellow	23,247
220	Palatine Black	12,050
182	Brilliant Sulphon Red	11,373
	Alizarine Rubinol	11,118
545	Patent Blue A	10,715
19	Fast Light Yellow	9,625
265	Sulphon Cyanine Black	9,484
860	Cyananthrol G	7,817
	Polar Red	7,756
531	Eriocyanine	7,716
	Guinea Fast Red	6,500
	Brilliant Milling Blue B	6,200

Vat Dyes

761	Indanthrene Golden Orange R (s. s.)	112,339
901	Ciba Violet B (single strength)	82,598
842	Lndanthrene Golden Orange G (s. s.)	71,466
869	Algol Brown B (s. s.)	64,468
831	Indanthrene Red BN (s. s.)	58,520
	Indanthrene Pink B (s. s.)	49,910
	Hydron Brown (s. s.)	41,881
907	Ciba Scarlet (s. s.)	40,200
849	Indanthrene Yellow (s. s.)	39,111
759	Anthraflavone G (s. s.)	34,436
	Indanthrene Blue BCS (s. s.)	32,610
844	Algol Blue 3G (s. s.)	32,396
913	Helindone Orange R (s. s.)	31,077
832	Indanthrene Violet RN (s. s.)	30,169

Mordant and Chrome Dyes

862	Alizarine Blue Black	77,093
778	Alizarine (Synthetic)	39,645
858	Alizarine Saphirol B	39,498
855	Alizarine Pure Blue B	19,627
856	Alizarine Astrol	16,117
779	Alizarine Orange	15,202
784	Alizarine SX, GD	10,910
551	Eriochrome Azurol BC	10,834
	Metachrome Blue Black	9,500
785	Alizarine RG, GI	9,360
	Omega Chrome Brown	8,003
	Anthracene Chromate Brown EB	6,669
	Eriochrome Flavine A	6,614
854	Alizarine Viridine	5,778
622	Delphine Blue B	5,597

Schultz No.	Class and Name of Dye	Quantity (pounds)
	Direct Dyes	
	Chlorantine Fast Brown	30,202
449	Trisulphon Brown B	24,020
	Chlorantine Fast Blue	17,067
392	Toluylene Orange	16,818
457	Trisulphon Brown GG	14,754
274	Diaminogene B	13,401
273	Diaminogene Blue	12,486
207	Diphenyl Fast Brown GNC	11,576
339	Brilliant Orange	11,100
	Diamine Fast Orange	10,263
	Chlorantine Fast Yellow	7,602
	Diazophenyl Black	7,496
	Diamine Catechine	6,282
	Diamine Brilliant Scarlet	6,000
	Basic Dyes	
573	Rhodamine B (s. s.)	94,504
571	Rhodamine 6G (s. s.)	56,825
606	Phosphine	24,300
705	Indamine 6R	7,900
618	Thioflavine T	6,842
609	Homophosphine	4,835
608	Euchrysine	4,525
559	Victoria Blue B	4,508
516	Crystal Violet	4,239
603	Acridine Orange	4,033
	Sulphur Dyes	
	Cross-Dye Green	30,567
	Thionol Brown	14,940
	Thional Brilliant Blue	6,001
709	Pyrogene Green 2G	4,630
746	Katigene Green	4,409

LIST OF VAT DYES WITH THE COLOR STRENGTH RATIOS BETWEEN PASTE AND POWDER

Schultz No.	Name of Dye	Ratio of Paste to Powder
	Algol Black CL 12½ Per Cent Paste	1 to 8
	Algol Black RO 12½ Per Cent Paste	" 8
	Algol Blue CF 12½ Per Cent Paste	" 8
844	Algol Blue 3G 12½ Per Cent Paste	" 8
839	Algol Blue K 12½ Per Cent Paste	" 8
821	Algol Blue 3R 12½ Per Cent Paste	" 8
829	Algol Bordeaux 3B 12½ Per Cent Paste	" 8
822	Algol Brilliant Orange FR 12½ Per Cent Paste	" 8
819	Algol Brilliant Red 2B 12½ Per Cent Paste	" 8
821	Algol Brilliant Violet 2B 12½ Per Cent Paste	" 8
820	Algol Brilliant Violet R 12½ Per Cent Paste	" 8
869	Algol Brown B 12½ Per Cent Paste	" 8
	Algol Brown G 12½ Per Cent Paste	" 8
869	Algol Brown R 12½ Per Cent Paste	" 8
870	Algol Corinth R 12½ Per Cent Paste	" 8
847	Algol Green B 12½ Per Cent Paste	" 8
834	Algol Gray B 12½ Per Cent Paste	" 8
834	Algol Gray 2B 12½ Per Cent Paste	" 8
833	Algol Olive R 12½ Per Cent Paste	" 8
824	Algol Orange R 12½ Per Cent Paste	" 8
818	Algol Pink R 12½ Per Cent Paste	1 to 8
	Algol Pink TR 12½ Per Cent Paste	" 8
825	Algol Red B 12½ Per Cent Paste	" 8
819	Algol Red FF Extra 12½ Per Cent Paste	" 8
816	Algol Red 2G 12½ Per Cent Paste	" 8
816	Algol Red 5G 12½ Per Cent Paste	" 8
819	Algol Red R Extra 12½ Per Cent Paste	" 8
815	Algol Scarlet G 12½ Per Cent Paste	" 8
823	Algol Violet B 12½ Per Cent Paste	" 8
811	Algol Yellow 3G 12½ Per Cent Paste	" 8
	Algol Yellow 3GL 12½ Per Cent Paste	" 8
817	Algol Yellow R 12½ Per Cent Paste	" 8
	Algol Yellow WF 12½ Per Cent Paste	" 8
	Anthra Bordeaux R (see Indanthrene Bordeaux B Extra)	
	Anthra Brown B (see Indanthrene Brown B)	
	Anthra Claret R (see Indanthrene Bordeaux B Extra)	
	Anthra Pink B (see Indanthrene Pink B)	
	Anthra Pink R (see Indanthrene Pink R)	
	Anthra Red B (see Vat Red B)	
	Anthra Yellow G (see Anthraflavone G)	
	Anthra Yellow GC (see Anthraflavone GC)	
759	Anthraflavone G 12½ Per Cent Paste	" 8
759	Anthraflavone GC 12½ Per Cent Paste	" 8
885	Brilliant Indigo B 20 Per Cent Paste	" 5
886	Brilliant Indigo G 20 Per Cent Paste	" 5
881	Brilliant Indigo 4B 20 Per Cent Paste	" 5
887	Brilliant Indigo 4G 20 Per Cent Paste	" 5
881	Ciba Blue 2BD 16 Per Cent Paste	" 6.25
882	Ciba Blue GD 16 Per Cent Paste	" 6.25
919	Ciba Bordeaux B 10 Per Cent Paste	" 10
	Ciba Brown R 12½ Per Cent Paste	" 8
891	Ciba Green G 10 Per Cent Paste	" 10
899	Ciba Gray B 20 Per Cent Paste	" 5
899	Ciba Gray G 20 Per Cent Paste	" 5
897	Ciba Heliotrope B 10 Per Cent Paste	" 10
911	Ciba Orange G 13½ Per Cent Paste	" 7.4
912	Ciba Pink 20 Per Cent Paste	" 5
	Ciba Pink BG 20 Per Cent Paste	" 5
909	Ciba Red B 12½ Per Cent Paste	" 8
906	Ciba Red G 10 Per Cent Paste	" 10
908	Ciba Red R 10 Per Cent Paste	" 8
907	Ciba Scarlet G 28 Per Cent Paste	" 3.57
907	Ciba Scarlet G Extra 20 Per Cent Paste	" 5
	Ciba Scarlet 3G 20 Per Cent Paste	" 5
901	Ciba Violet B 10 Per Cent Paste	" 10
900	Ciba Violet 3B 10 Per Cent Paste	" 10
901	Ciba Violet R 10 Per Cent Paste	" 10
890	Ciba Yellow G 10 Per Cent Paste	" 10
	Ciba Yellow 2R 11 Per Cent Paste	" 9.09
	Ciba Yellow 5G 11 Per Cent Paste	" 9.09
794	Cibanone Black B 12½ Per Cent Paste	" 8
793	Cibanone Blue 3G 8½ Per Cent Paste	" 11.76
868	Cibanone Brown R 22 Per Cent Paste	" 4.55
	Cibanone Brown R 10 Per Cent Paste	" 10
868	Cibanone Brown V 22 Per Cent Paste	" 4.55
	Cibanone Green B 10 Per Cent Paste	" 10
792	Cibanone Green G 10 Per Cent Paste	" 10
	Cibanone Olive B 10 Per Cent Paste	" 10
792	Cibanone Olive G 10 Per Cent Paste	" 10
792	Cibanone Orange R 12½ Per Cent Paste	" 8
795	Cibanone Yellow R 12½ Per Cent Paste	" 8
	Helindone Black 2BD (for printing) 30 Per Cent Paste	" 3 1/3
	Helindone Blue 3G 10 Per Cent Paste	" 10
896	Helindone Blue 3GN 10 Per Cent Paste	" 10
	Helindone Blue 3R 20 Per Cent Paste	" 5
	Helindone Brown CM 10 Per Cent Paste	" 10

(*Continued on page* 101)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

Vice-Presidents
WILLIAM D. LIVERMORE E. H. KILLHEFFER

Secretary
WALTER E. HADLEY
5 Mountain Avenue, Maplewood, N. J.

Treasurer
WINTHROP C. DURFEE
516 Atlantic Avenue, Boston, Mass.

Councilors
RALPH F. CULVER GEORGE A. MORAN
ARTHUR E. HIRST WILLIAM K. ROBBINS
WILLIAM R. MOORHOUSE WALTER M. SCOTT

LOCAL SECTIONS AND THEIR OFFICERS

Northern New England Section—
John F. Bannan, Chairman, M. T. Stevens & Sons Co., North Andover, Mass
A. K. Johnson, Secretary, Lowell Textile School, Lowell, Mass.

Rhode Island Section—
Walter S. Williams, Chairman, Mount Hope Finishing Co., North Dighton, Mass
Albro N. Dana, Secretary, Franklin Process Co., Providence, R. I

New York Section—
E. F. L. Lotte, Chairman, National Silk Dyeing Co., Paterson, N. J
Daniel P. Knowland, Secretary, Geigy Co., 89 Barclay Street, New York City.

Philadelphia Section—
Elmer C. Bertolet, Chairman, Philadelphia Textile School, Philadelphia, Pa.
Percival Theel, Secretary, Philadelphia Textile School, Philadelphia, Pa.

Southern Section—
Harold M. Chase, Riverside and Dan River Cotton Mills, Danville, Va.
Harry W. Ormand, Secretary, Union Bleachery, Greenville, S. C.

JANUARY MEETING OF RHODE ISLAND SECTION

The January meeting of the Rhode Island Section of the American Association of Textile Chemists and Colorists was held at the Turks Head Club, Providence, R. I., Thursday evening, January 15th.

Dinner was served, at which thirty-nine members were present. R. F. Culver, Chairman, presided.

The Nominating Committee proposed the following officers who were unanimously elected for the ensuing year: Chairman, Walter S. Williams; Secretary, Albro N. Dana; Treasurer, Ben. Verity.

Sectional Committee.—Herbert F. Schwarz, Karl R. Moore, John G. Masson, William H. Wingate.

Regret was expressed that Mr. Culver, Chairman, and Mr. Fletcher, Secretary, felt it necessary to refuse renomination. A rising vote of thanks and appreciation was given to the retiring officers for their untiring service to the Association.

The Section was fortunate to have present Professor Louis A. Olney, who spoke to the members on the needs and aims of the Association. A summary of his remarks is published below. Stewart F. Carter, of Jacques Wolf & Co., then gave an interesting lecture on "Zinz Ferrocyanide as a Mordant." Mr. Carter's paper is published herewith. A vote of thanks was given the speakers of the evening.

Respectfully,
A. N. DANA, Secretary

Address of Professor Olney

Mr. Chairman, it is a great pleasure to be here this evening as the guest of the Rhode Island Section. Your Section has the distinction of being the oldest in the Association, and owing to the active endeavors of your first chairman, Wm. H. Cady, and the able direction during the past two years of your retiring chairman, Ralph F. Culver, it has the reputation of being one of the most active and progressive of all of the Sections. Furthermore, the choice you have made this evening in electing Walter S. Williams portends a continuance of the activities and successes of the past.

I doubt if we appreciate the extent to which the future success of the Association as a whole depends upon the activity of the Local Sections and the manner in which they function. Since we have but one annual meeting each year, the Local Sections present the greatest opportunity for the presentation of papers, and the valuable discussions which usually follow. In order that these papers and discussions may prove of value to the whole Association, it is quite essential that they be published in the Proceedings as completely and promptly as possible. This makes it desirable that those who speak and present papers before the Local Sections have a manuscript covering at least the important phases of the subject they present in order that it may be published as correctly and fully as possible.

I wish also to call your attention to the advisability and desirability of drawing upon the members of your own Section for papers. Oftentimes the Executive Committee of Sections will spend much time in hunting around for an outside speaker when excellent home talent is available if it can only be brought out.

Remember, that just as the success of the parent organization is largely due to the activity of the Local Sections, so the success of the Local Section is due to the activity and interest of the individual members of that Section, and when you are called upon to take part in the program do so without hesitation, even though it may mean some sacrifice, and you may not feel that you are fully qualified. You will find that you were far better qualified than you at first thought, and the satisfaction of having done something to help the Association will more than repay you for the trouble and worry.

The prompt payment of dues is another way in which the individual may aid the Association. It takes but little arithmetic to see that if we pay $2.50 for the distribution of the Proceedings through the AMERICAN DYESTUFF REPORTER, and return one dollar to the treasurer of the Local Section, that there is but $1.50 left for the expenses of the Associate, and one member who neglects to pay his dues promptly not only prevents this $1.50 from becoming available but the $1.50 available from three members who have paid is actually being spent upon him.

. . . President Olney then spoke of the work of the Research Committee, and the necessity of receiving financial support through corporation memberships, and the advisability and possibilities of an active members' research endowment fund. He also spoke in regard to the coming exposition of the Chemical Equipment Association which is to be held in Providence next June. In this connection he said: "It is expected that about 2,000 chemical engineers and industrial chemists will be in Providence at the time of this exposition. The Institute of Chemical Engineers will hold their regular meeting in connection with this exposition, and plans are being made for a joint meeting of the Rhode Island and Northern New England Sections of the Association at the same time, with a general invitation extended to all the members of the Association to attend this meeting. It is hoped that there will be a large attendance of textile chemists and dyers, and it is believed that an excellent opportunity will thus be presented, not only from an educational but a social point of view.

"This exposition will be unique in that no admission will be charged, and only those invited who are directly interested in some phase of the exposition. Altogether too frequently such expositions are more or less monopolized by a large group of disinterested people who attend largely out of curosity rather than for any legitimate reason, and simply detract the attention of those in charge of the exhibits from those who might profit decidedly through an interview."

After touching briefly upon several phases of the Association work, Professor Olney closed his remarks by extending the best wishes of the Association to the Rhode Island Section, and the newly elected officers.

Zinc Ferrocyanide as a Mordant*

By STEWART F. CARTER
Jacques Wolf & Co.

The first mention of the possible mordanting power of ferrocyanide is contained in a communication to the Industrial Society of Mulhouse made by Charles Reber, December 5, 1884. He noticed that potassium ferrocyanide gave a precipitate with "certain basic colors." These most probably were those colors which are double zinc compounds. While a number of zinc free colors give a precipitate with ferrocyanide which in many cases takes some time to form, this cannot be regarded as a true lake, but rather as a ferrocyanide compound of the color. They lack the bloom and body of the zinc ferrocyanide lake which retains its color and is sufficiently fast for ordinary practical demands.

Henri Schmidt advised Charles Reber to try the insoluble ferrocyanides, more especially zinc ferrocyanide, which being white, would suggest itself as a suitable mordant. Ferricyanide was also mentioned by Mr. Reber, but this I have found to give very inferior shades to the ferrocyanide.

After further trials Mr. Reber suggested that zinc ferrocyanide lakes might be printed as pigments with albumen or that cotton cloth might be padded in a solution of ferro- or ferricyanide, or thickened solutions printed, and the zinc ferrocyanide or ferricyanide formed on the cloth by subsequent passage through a zinc sulphate solution; the cloth then being washed and dyed with a suitable basic color.

There does not appear to be any record of these observations being followed up and turned to any practical account until nine years later, when the zinc oxide resist process under Aniline Black came into practice.

In this process the white cloth is printed with colored resists consisting essentially of zinc oxide, thickening, and a suitable Aniline Black, which consists of aniline salt, sodium or potassium ferrocyanide, and sodium or potassium chlorate. On aging or steaming, the black develops, except where the zinc oxide of the resist neutralizes the hydrochloric acid of the aniline salt and prevents its formation, a simultaneous formation of zinc ferrocyanide fixing the coloring matter, an unusual instance of a resist acting also as a mordant.

It was generally considered that the passage through the Mather & Platt ager, or steaming, was what caused the fixation of the color. This, however, is not the case, the color being fixed by the formation of zinc ferrocyanide in its presence.

If a swatch printed with zinc oxide resists be taken after padding with the Prussiate Black, before drying,

*A paper presented before the Rhode Island Section, January 15, 1925.

and washed, the color will be found to be as completely fixed as it would be after having been steamed.

On the other hand, if zinc ferrocyanide be formed on the cloth by padding in sodium ferrocyanide and consequent passage through zinc sulphate solution, it can be dyed up with a basic color in the usual way, thus showing it to be a true mordant.

Being interested in the mordanting power of zinc ferrocyanide, I made a number of experiments with a view of determining what amount of color was taken up by a definite weight under different conditions.

Two conditions were to be considered:

1. When the mordant is actually dyed up with the coloring matter; that is, the color lake formed by an actual dyeing process.

2. When the color lake is formed by precipitation of zinc ferrocyanide in presence of an excess of color.

The method followed in the first case was to produce a definite weight of zinc ferrocyanide by bringing together in a suitable amount of water the requisite quantities of standard solutions of zinc sulphate and potassium ferrocyanide, adding an excess of coloring matter, making the whole up to a definite volume, boiling for one hour, cooling, making up to the original volume, and determining the excess color colormetrically.

In the second case, the excess of color was added to the water, then the zinc sulphate solution, and then the potassium ferrocyanide solution; the whole made up to a definite volume, and the excess (or uncombined color) determined colormetrically.

It was, of course, necessary to use a zinc free color. Methylene Blue DBB was, therefore, employed.

The strengths of the zinc sulphate and potassium ferrocyanide solutions were carefully verified by analysis and titration, one on the other.

It was also considered well to make a side trial with potassium ferrocyanide alone. In this case potassium ferrocyanide equivalent to one gram of ferrocyanide was added to the same amount of color solution as used in the regular experiments. It was found that the ferrocyanide compound of the color base formed very slowly, so much so that four days' standing with occasional stirring was necessary for complete precipitation. The uncombined color was then determined.

The results of the following experiments will be of interest:

1.—*Actual Dyeing of Zinc Ferrocyanide Precipitate*

	Grams of Color
One gram zinc ferrocyanide combines with—	
A. After boiling one hour	2.264
B. After boiling one hour, letting stand four days with occasional stirring and then boiling one hour more	2.488

2.—*Precipitation of Zinc Ferrocyanide in Presence of Color*

	Grams of Color
One gram zinc ferrocyanide combines with—	
A. Filtered directly after precipitation	2.408
B. After precipitation let stand four days with occasional stirring, then boiled one hour	2.456

3.—*Precipitation of Ferrocyanide—Color Compound*

	Grams of Color
Potassium ferrocyanide equivalent to one gram of zinc ferrocyanide takes—	
A. After solution has stood four days	2.760
B. After solution has stood four days and then boiled one hour	2.488

This last was regarded as the actual combination and agrees with the corresponding trials 1B and 2B. In all these trials the same conditions of strength and volume of solutions were carefully maintained.

The second trial in which the color lake is formed by precipitation of the zinc ferrocyanide in presence of the coloring matter, represents the conditions which obtain in the Aniline Black resist style. In practice the formation of a good amount of zinc ferrocyanide is desirable because, apart from its action as a mordant, it assists very materially in holding the shapes of fine objects.

All practical people are aware that some of the basic colors give much brighter and clearer shades than others with zinc ferrocyanide. This fact has never been explained and is due to some, at present, obscure reason.

In the first trial where the zinc ferrocyanide is actually dyed up, the conditions are different to a certain extent, to what they would be in dyeing cotton mordanted with zinc ferrocyanide, as the mordant is presented to the color in a state of very fine division as compared with the closer and more compact state in which it is attached to the cloth. In the former condition it may be considered as combining with the color to its fullest extent. In the latter its physical condition may cause it to be somewhat less receptive.

In any case, the foregoing experiments appear to give us a pretty clear idea as to the extent to which the color unites to form the lake.

I have noticed recently in some foreign publications that attention is called to the suitability of zinc ferrocyanide lakes for printing linings and for printing and coloring paper.

It does seem that these colors might be utilized in some classes of goods when it was desired to do without steaming.

A color composed of suitable thickening, a zinc salt and the coloring matter would be printed and then fixed

with passage through sodium ferrocyanide solution, washed and dried.

In dyeing cotton piece goods mordanted with zinc ferrocyanide, the fact may be pointed out that if goods so mordanted and dried be printed with caustic soda and when washed, without passage through the Mather & Platt ager, the mordant is discharged and a white object is obtained when dyed with suitable colors.

JANUARY MEETING OF THE NEW YORK SECTION

The regular monthly meeting of the New York Section of the American Association of Textile Chemists and Colorists convened at 8.15 p. m., January 23, 1925, at Stewart's Restaurant, 30 Park Place, E. F. L. Lotte presiding. The Secretary's report and the Treasurer's report for the year 1924 were presented and approved by motion. There being no further business on hand, Chairman Lotte introduced the speaker for the evening.

Chairman Lotte—I am glad to announce that our speaker to-night will be Dr. Allen Rogers, of Pratt Institute. His subject will be "The Dyeing and Finishing of Leather." Dr. Rogers needs no introduction to most of the folks here, and we will ask him to go right ahead with his address. Dr. Rogers. (Applause.)

The Dyeing and Finishing of Leather

By Dr. Allen Rogers

Pratt Institute

Mr. Chairman and Gentlemen: It is certainly a great pleasure for me to come over and have dinner with you to-night, and I am glad to pay for my dinner by talking a little bit about leather.

Leather is quite a broad subject, and as I don't want to tire you all out I won't talk too long. It may be of some interest just to say a few words about the history of leather. The leather industry is the oldest industry in existence. That is proven when we read our Bible and refer to Genesis 3:21. We read there that unto Adam, and also unto his wife, "the Lord made coats of skins and clothed them." So the leather industry really started in the Garden of Eden.

The tanning industry depends, of course, upon the pelts of animals, and from that time in the Garden of Eden up to the present day pelts have been used for the comfort of mankind, either for clothing or for shoes. The cave man didn't have any textile industry; he couldn't get any silk, worsted or cotton, but he could go out and kill an animal and preserve its hide.

In the early form, of course, the hide would rot, if they used it in its natural condition; of course, that wasn't satisfactory. They knew that if they dried the hide out it became hard and stiff, and that wasn't satisfactory. So they early learned to treat those hides, and the earliest process of treating hides was no doubt by the use of the oil and the brains of the animal—the old oil tannage method, which is still in existence to-day. Later on they discovered the alum tannage, and after that—a good many years later, probably——they began to use vegetable tanning material in making leather. But the leather industry as we know it to-day is a very modern industry. In fact, it dates back to 1884, when an American chemist discovered the so-called two-bath process for converting hides and skins into leather.

After the introduction of that process the whole leather industry was revolutionized; it was put on more of a scientific basis, and to-day there is more chemistry to the square inch, I think, in the leather business than in almost any other industry.

Raw Materials from Foreign Sources

The raw materials that we use in making leather come from all parts of the world. We get hides from South America, China, Africa and Australia, besides our own domestic hides. Then, we get skins from all over the world—goatskins from Africa, Australia, Egypt, India, China, South American countries and our own country. Besides goatskins we have calfskins coming from native stock and also from Russia, France and other European countries. We have sheep skins coming from England and our own domestic sheepskins. Besides these, there are many other different kinds of skins used for leather, some used in very large quantities, others in smaller quantities.

In that connection I could mention, of course, the skins of seals and walruses, alligators, kangaroos, camels, elephants, whales, sharks and monkeys—those they don't use the glands from make very good leather (laughter)—dogs, and even humans. I meant to bring along some samples of human leather. It makes a very good article, somewhat like pigskin. In fact, it is very difficult to tell the difference between human leather and pigskin; the hair goes right through to the flesh, so we must be somewhat related. (Laughter.)

I have personally been interested in a development of sharkskin leather and have become well acquainted with the sharks. I have some samples of sharkskin leather here that I will show you a little later.

I don't want to go into the tanning process, because that would take too long, except to say that at the present time 95 per cent of the sole leather used in shoes is made by the vegetable tanning process and is made from the hides of beef animals, from the steer hide especially.

In talking of leather, we always talk of two kinds of pelts; that is, we speak of skins or hides. When we say "skin" we mean the covering of a small animal. When we say "hide" we mean the covering of a large animal. Some-

times one who isn't accustomed to dealing with leather talks about a cowskin or a goat's hide, which is a very sad breach. If you go to a goatskin tanner and try to sell him some colors for his hides, or if you go to a side leather plant where they are making bag and case leather, and talk about skins, they will wait until another salesman comes along. It is not good etiquette to talk about skins when you mean hides, or hides when you mean skins.

Various Leathers and Their Uses

Certain kinds of heavy leather go into sole leather. The other heavy leather hides go into side leather, bag and case leather, and automobile leather. The selection of those hides, of course, depends entirely on the character of the hide. If it is a very plump, heavy hide the machinery belting manufacturer gets it. If it is a fairly heavy hide, not very spready, the sole leather man gets it. If it is a very spready, flat hide the automobile leather manufacturer gets it.

Calfskins go almost entirely to the shoe trade, and 95 per cent of the calfskins are tanned in chrome for shoe uppers.

The sheepskins go into fancy leather; imitations of all different kinds of leather are made from sheepskins. From sheep we have pin-seal, walrus, shark and alligator; we can make most anything out of a sheepskin by embossing it. Of course, it is cheap and is usually used in a bag of some kind where you don't expect to get wearing qualities.

The sheepskin is usually split in two parts. One is called the plushing, and the other the skiver. The skivers are used for hatbands, pocketbooks and so forth. The fleshy part goes into chamois. Real chamois are goats, but the chamois is practically extinct; all the chamois skins we now have are made by splitting the fleshy part off the sheep and tanning that in oil.

This is a chamois skin [exhibiting] that was made at the school. I might say that at Pratt Institute we have a laboratory called the Chemical Industries Laboratory, and in that laboratory we have little factories where we teach boys factory methods.

The kangaroo leather practically all goes into shoes. The manufacturers of kangaroo leather are feeling depressed because they formerly sold a lot of that for ladies' shoes, but to-day ladies' shoes don't have any leather in them.

The fancy leathers, like alligator, seal, walrus, shark and some of the other odd leathers, go mostly into the fancy articles; that is, bags, pocketbooks and dress-suit cases.

Shark leather, a sample of which I will show you in a little while, has been interesting to me, as I said before, because I have been in the thing since the start. Practically all the shark leather at one time was used for sword handles and emery wheels. Now that we have gone out of the business of making swords we can't have much use for shark leather in sword handles, and carborundum has replaced it in the emery wheel, so the poor sharks didn't have very much to live for. (Laughter.) They tried to make leather from sharkskin by scraping the surface off, but when you try to scrape that covering off the sharkskin with a scraper of some kind it wears the scraper down faster than the skin itself.

About eight years ago, while doing some work on sharkskin, I chanced to throw a skin into some strong acid, and I said something at the same time that I wouldn't want to say in the presence of ladies. In a short while I pulled the skin out and it was in fine shape; it looked like calfskin. Advantage has been taken of that peculiar reaction, and to-day we throw two or three hundred sharkskins into a pail at one time and they come out equal to calfskin.

Sharks can be used to good advantage now, and they have a good-sized pelt. An ordinary shark averages about 8 to 10 feet in length, and the different species, of course, give different kinds of leather. Besides that, the shark has a large liver, from which the oil can be extracted. About 50 per cent of the weight of the liver is oil. Then, it has a very good meat. That meat is dried and sent to New York or somewhere else, where it is worked over and shredded into codfish. (Laughter.) It is a very good food substance.

I brought along to-night—I thought perhaps they might be interesting—some different kinds of leather, knowing that I would mention something about the dyestuffs used on them. I know you are interested in that more than in the source of leather and methods of manufacture.

The Chrome-Tanning Process

These [indicating] are some samples of calfskin which are used for shoe leather. These are chrome-tanned, by the chrome-tanning process. First, the skin is soaked in water to remove the salt and blood and dirt, and make it soft. Then it is put into a depurating solution, either lime and sodium sulphide or sometimes straight lime, which opens up the hide, plumps it, and loosens the hair. The hair is then pulled off on a machine and the skin is washed and put into the bate. The object of that bate is to remove the lime and open up the skin, to make it soft and flaccid again. After the bating, the skin is pickled in sulphuric acid and salt, and then tanned in chrome.

The Schultz process was a two-bath process in which the skins were first run in bichromate of sulphur, and then the chrome was fixed in the leather. That took two operations and was more or less wasteful because an excess of chrome had to be used.

Martin Dennis, over in Newark, worked on a process

that had been originally worked out by a man named Knapp in England, and Knapp said it wasn't practical because the skin turned green. Martin Dennis worked out a process for making one-bath liquor. He patented this process, but the process would probably never have stood the test of a court, for many people made one-bath chrome liquor even when the patent for his process was still alive and no court suit was ever brought. To-day almost anybody can make a one-bath chrome liquor. A great many tanners make their own liquor and many firms sell liquor to tanners.

As I explained, after these skins are bated they are pickled and then put into the one-bath chrome liquor, where they change from raw hide into leather. After the tanning they are shaved and then colored.

Coloring of Chrome Leather

The usual method for coloring chrome leather is to run the skins in some vegetable tanning material or some dyestuff, like fustic or Osage Orange, if it is a tan shade, or logwood or Hematine and striker if it is a dark shade of leather. That gives to the leather a bottom which gives fullness of shade. On top of that is then added tin or antimony, to set the tanning material, followed by a basic color, the basic colors used depending, of course, upon the shade that you want to get. In the leather trade the most common dyes for tan shoes are phosphines, Bismarck Brown and the other colors used for getting tan shades.

Then the leather is washed and fat-liquored, usually with sulphonated oil. Soap and oil was formerly used, but to-day they use sulphonated oil, sulphonated cod or neat's, and with that carry a certain amount of cod-liver oil and sometimes egg yoke, or something else, with it.

The purpose of adding the oil is to keep the leather soft. Then it is put in the dry loft. If you didn't have the fat liquor the chrome leather would be like a board, but with the oil the leather dries soft and flexible; that is, it will get soft afterwards; it dries fairly hard, but it is not bony.

The leather is then put into what is called a "sammy"; that is, the skins are placed either in damp sawdust or dipped in water and put in piles. Then they are worked on a staking machine and tacked on boards. After tacking, the leather is taken from the boards and the seasoning is applied.

In leather to-day a great deal of pigment is being used. Sometimes the pigment is added during the fat-liquoring, but in most cases the leather is dyed and then the pigment is applied in the finish. That was brought about during the war, when it was difficult to get dyestuffs and tanners resorted to pigments.

Many firms will say that they don't use any pigment in their leather, but if you ask them, "Do you use any lacquer?" they will say, "Oh, yes, we use some lacquer, but we don't use any pigment." (Laughter.)

There is only a small amount of pigment used in the finish. There is some mystery, more or less, about pigment finishes, but they are nothing other than regular pigments, Chrome Yellow or Russian Blue, or whatever pigment you are going to use, ground in sulphonated oil. This sulphonated oil, of course, is then mixed with water. Those pigments are then put into a finish made of casein, flaxseed, Irish moss, egg albumen, or any of the different materials used for finishes, and that colors up the finish.

The important feature of a pigment finish is that if your color isn't clear in the actual dyeing in the drum the pigment draws it up and makes it a very nice leather. Here is a piece of Scotch grain which is very popular this spring; it is a chrome-tanned leather.

Besides using the basic colors on leather, some tanners use other colors—alizarines, direct colors, substantive colors, etc. Some have even suggested the use of sulphur colors. I have made some blacks with sulphur colors that came out good.

With regard to black leathers, in making a calfskin the leather is sorted to select the best grade of stock; they put the best grade of stock in the colors and the poorer grade in the black, because you can cover up many defects with black that can't be covered with light shades. There are many direct blacks used on leather, but the best blacks made usually have a logwood bottom, a logwood and iron bottom, or a logwood, iron and copper bottom; then they are topped off with Nigrosine, or some direct leather blacks.

Finishing Methods

Finishing methods do not vary much. In making finishes, if a dull finish is wanted Irish moss is used, sometimes with a certain amount of starch or flour. That is applied to the leather and the leather is ironed, sometimes rolled, but usually ironed, and then oiled off with quite an excess of oil and reironed or rolled. That gives a dull finish. If they want a semi-bright finish, gun-metal, then the leather is rolled on a rolling-jack. But when they want a bright finish, like what we call vici kid, the leather is put on a machine called a glazing-jack, in which a glass roll goes over the leather at a high rate of speed; the friction that is produced brings up a high gloss.

The goatskin business of this country has its ups and downs. Sometimes there is quite a demand for goatskins, at other times no demand at all. Women, as a rule, wear more kid than men do. Generally, men don't care for kid shoes. A kid shoe is a softer shoe, but it is very apt to scuff because the grain of a goatskin is thin; a woman, of course, doesn't scuff her shoes up as much as a man.

The first company to do any amount of glazed kid leather was Foerderer of Philadelphia. They introduced

the two-bath process for making goatskins by the Schultz process. Several other concerns took up the process and there was litigation for a good many years before it was settled. To-day, of course, there are no patents in the market.

I have been doing some work recently for one of the large shoe manufacturers in Brooklyn which is not exactly in the line of coloring leather but which, I think, is rather interesting. When you buy a pair of shoes you don't know whether they are going to wear or not. For the last year I have examined hundreds of pairs of shoes, damaged shoes that were sent back, in an effort to locate the cause of damage. We have decided very definitely that certain damages are due to undertanning. A cracky shoe, for example, is always due to that. It is especially noticeable in goatskins and kid leather. You do not find it so much in calf, because calfskins are a fully tanned leather, while goatskins are undertanned leather.

As a result of that work, this particular manufacturer is now specifying that his leather must be fully tanned, and it is cutting down the losses in his plant. We also hope to cut down the losses incurred from returned shoes.

The side leather and goatskins are tanned in chrome. Then we come to the vegetable tannings, like sheep. There we use a chrome, alum, oil or vegetable tannage. Then the skins are colored, either with basic colors or, as in the case of glove leather, with acid colors. The advantage of an acid color in glove leather is that it goes through. Basic color, of course, stays on the surface. People like the color to go through so that the edge of the glove won't show white. Sometimes they get good results with basic color, but to-day most of the glove leather people are using acid colors or direct colors in order to get thorough penetration.

I haven't any very good glove leather with me, but here is a sample of an inferior glove leather made from sheepskin. The glove leather business of this country is centered around Johnstown and Gloversville, where most of the glove leather is made, and where practically all the gloves are made.

These samples of leather that I am showing you which have this peculiar grain on them are sharkskins. That is not embossed grain, but the natural grain of the animal; these small pieces are of different species. All those that have that peculiar embossed grain are shark leather.

Patent Leather

Another kind of leather that is quite interesting, because it shows what chemistry has done for the leather business, is patent leather. I think perhaps we can all remember our first pair of patent leather shoes; how they would shine, and how they would draw our feet, and how they would crack. (Laughter.) To-day patent leather shoes don't have any of those qualities. They don't shine as much as they used to, perhaps; they don't draw our feet, and they don't crack. The reason for that is that to-day practically all patent leather is what is called non-degrease patent leather. The old method was to tan the leather, then fat-liquor, then take out all the fat, and by that time it was like a piece of blotting paper. Then they put on a coat of dope, then a coat of varnish, then some more varnish, until they had a nice varnish, and underneath they didn't have anything but a piece of blotting paper. You had your foot encased in a varnish cast, and the minute that varnish became a little cold it would crack and the whole shoe would crack.

They tan the leather in chrome, and fat-liquor with sulphonated oil, neat's-foot oil or some other oil. Then they remove that excess of oil, but leave the sulphonated oil in the leather, which leaves the leather strong and flexible. They put on a dope coat, then one coat of varnish, and the result is a fine piece of leather that will stand up as well as any other leather.

The automobile leather people are large users of dyestuffs, colors and pigments. The leather that you see mostly to-day on automobiles has what is called the dope finish.

There are two kinds of finishes, the varnish coat and the dope finish, and the better grades of cars use the dope finish. This dope is guncotton mixed with flaxseed oil or linseed oil, and with the pigment it is spread on the leather, then dried or partly baked, and embossed. The same thing is done by using a heavy linseed oil. That is put on wtih pigment and spread on the leather, which is then embossed.

Some people don't like leather for upholstery in automobiles, so they have gone to plush and fabrics, but now there seems to be a little return to leather.

In the last few years there has been a move to devise a different finish for automobile leather in which they emboss it in designs to represent fabrics. An automobile man found that he couldn't sell leather because it looked too much like leather, so he began to imitate fabrics on the leather. Here are some samples of embossed leather to represent fabrics.

They have gone one step farther, and now are putting out leather of these designs, which represent something like a Paisley shawl effect. They are putting some of this on furniture and some of the cars are being finished with it. This is a block pattern and makes quite a novel effect on leather.

With regard to the women's shoe trade, some manufacturers are always bringing out new things in ladies' shoes—gold shoes, silver shoes and a variety of other colors. I brought this piece of silver leather along. It is goatskin and has silver on the surface. They put gold leaf on, and it makes a very pretty evening shoe when it is finished up. Of course, to-day the leather people are

more or less up in arms against these fancy shoes, because they use so much fabric, satins, brocades and other material. This is a chrome-tanned white leather, which is a washable white leather used in shoes. Alum tan can't be washed, but if you use chrome tan properly filled it can be washed.

Dressing and Dyeing of Furs

My time is nearly up, but I would like to say just a word about furs; although furs are not in the leather business, in a way they are connected with it. I have been interested more or less in furs and I would like to tell you a little about the subject.

The dressing and dyeing of furs is usually done by an oil tanning process, an alum tanning, or sometimes a straight simple salt and sulphuric acid. Salt and sulphuric tannage of furs is no good; it soon cracks the leather; if it gets wet it rots. Alum tan is more satisfactory. It will wear better. But the best tannage you can use for furs is an oil tannage.

There is one concern in St. Louis that does nothing but tan sealskins. I am working on a little problem for them, and as these furs came in yesterday I brought them over because I know that very few people have ever seen the real Alaska seal in its different stages. I couldn't bring along the sealskin as it comes from the animal, because it is all full of blubber and grease, and wouldn't be an interesting thing to see.

The skins are taken after the seals are driven to shore. The animals are knocked over the head with a club and then skinned. The skin is sent to St. Louis, where it goes to the tannery; the first operation is to take off the guard hair around the edges. Those guard hairs protect the animals as they roam over the rocks; they protect the wool underneath.

The skin is put in an oven, and when it gets to the proper temperature all the guard hairs are rubbed down with a blunt knife. Then the skin is put on hooks to stretch, and later is put into stocks or kickers, with the seal oil, its own oil from its blubber, and its leather.

I have some skins with me as samples. I am sorry I haven't a finished skin, but I have one that is partly finished. After the leathering, the skins are dyed. The dye for ordinary sealskin is a black dye and it is put on with a brush. It takes twenty-eight days to dye it, twenty-eight applications of dye and striker, until they get the full black shade, and it must be so that when you blow it you can see the black coming right on to a light brown inside. After those skins are dyed they are plucked and then shaved on the back, and we finally get a skin which when finished is worth sixty dollars.

Real Alaskan seal, therefore, is expensive. When your wife wants a real sealskin, an Alaskan sealskin, coat you have to pay about twelve or fifteen hundred dollars, because it takes eight or ten of these skins; then, of course, the manufacturer of the coat has to have some money for his work and you have to pay a little more for having a sealskin coat. (Laughter.)

This year a new shade was brought out in sealskin. As the young ladies didn't like the black so well because it made them look too old, there seemed to be a demand for a slightly different shade. This is a shade of seal that has been brought out this year. It is called Chatain. It is a brown. This is a damaged skin, but a Chatain skin this size would be worth about $125. Because of its color the Chatain is a little more expensive. Of course, if you don't like the Chatain you can always have it dyed black. (Laughter.) I am sorry I haven't a finished skin with me, because they look better than this skin, but this is nearly finished. Neither of them has been plucked yet; they haven't had their final gloss coats and they haven't been buffed down on the back.

The imitation seals, of course, are made in the same way that the Alaskan seal is made, so far as the tanning goes; oil tannage is used and they are dyed the same way. The Hudson seal is made from the muskrat. It is a very nice skin and is preferred by some people to the Alaskan seal because it is lighter.

Then we have the French seal, which is made from rabbits and dyed black, and Chatain. This brown we have here is becoming quite popular and they are dyeing other skins this Chatain color.

I am afraid I have taken up too much time, but I certainly want to thank you for inviting me over here, and if there is anything I haven't mentioned I will be glad to answer questions. (Applause.)

Discussion

Chairman Lotte—I am sure we have all enjoyed listening to Dr. Rogers. I know that I know more about skins than I did when I came here, and I am glad to have learned what I did from his talk.

It is our custom to throw the meeting open for discussion after the presentation of a paper or address, and we would be glad therefore to have anyone at this time ask Dr. Rogers any questions he has in his mind. Dr. Rogers has made it easy for us, because he has invited us to ask questions.

L. J. Dogin—What class of dyestuffs are used for dyeing the black and brown on seal?

Dr. Rogers—Those are wood colors, vegetable colors.

Mr. Dogin—Is that why it takes twenty-eight days?

Dr. Rogers—Yes. Vegetable colors are used entirely on those blacks. They don't use any aniline colors on the blacks. The brown has some aniline coloring. In applying those coats to furs they rub it down and then run it on the striker. Then the skins are cleaned entirely

from that color and the dyestuff is added, then striker again. Then that is cleaned again, and so on. That is done twenty-eight times.

In certain blacks outside of the sealskin (of course, there are a lot of black furs, caraculs, broadtails, etc.) developed dyes are used, the paraphenylene diamine dyes, developed with peroxide. The bulk of the cheaper grade of black furs are dyed that way. They dye them in a paddle. They don't usually brush them on. Of course, you can use other colors, but in this particular seal that is one of the things they guarantee: that they are natural colors. There seems to be a prejudice against aniline colors on seal.

C. F. Schaumann—How are these prints put on?

Dr. Rogers—By block printing.

Mr. Schaumann—Are pigments used?

Dr. Rogers—Yes; they are practically the same pigments as are used in printing wall-paper. The only disadvantage in connection with that leather at the present time is that it smuts when it gets wet. They are trying to put some finish on to prevent that smutting. It won't smut much, but it will smut if you get it damp.

Chairman Lotte—Are most of the seals dyed in London?

Dr. Rogers—No; there are practically no sealskins in this country now that are dyed in London. Up to 1918 we depended on London for all our sealskins. Seals came down to Alaska and to Washington. They were shipped across the United States, then across the Atlantic to London. They were dressed and dyed in London and shipped back to the United States, and then we bought them and paid for all that freight.

The sealskin made in this country now is much superior to the old English sealskin. In fact, when the industry was started in this country it was started by people who formerly made sealskins in England. They came over here and started a factory. It is owned by American capital, in which the Funston brothers are interested. The Funstons are the largest fur dealers.

I might say a word about how these skins are sold. The Government sends the skin to St. Louis, where it is dressed and dyed. At the annual sales in the spring and fall those skins are sold. Uncle Sam owns every one of them. The dressers and dyers do not own them. If they spoil a skin they have to pay for it. At the same time that those skins are sold other kinds of furs are sold In St Louis every week there is an auction of raw skins. St. Louis is a great fur center.

Mr. Chapin—I didn't hear you say anything about porpoise. Has that succeeded commercially?

Dr. Rogers—The trouble with that is that it is too hard to catch the porpoise to make it a successful commercial proposition. Porpoise travel in schools, and if you are fishing for porpoise you might get a big pull one day and you might have to wait a month before another school came along. The concern in Newark that is tanning sharkskins has ceased trying to get porpoise. They have to keep a crew of men waiting, and they are on the watch all the time for the porpoises, because when you fish for porpoise you must have about twelve or fifteen men in order to catch the school. The men go out in two boats and surround the school with a purse net, then they join the net together and pull the fish back to the beach. The biggest pull I ever got was twenty porpoise. I have forgotten how many square feet of leather we got out of that pull. It gives very good leather, but it doesn't pay.

With the shark, on the other hand, you can set your nets and wait for the sharks to come. They will vary. The largest catch of sharks I ever ran across was one hundred and sixty-five, and when you get one hundred and sixty-five sharks into your boats you have a fairly good catch.

Mr. Chapin—How much do they weigh?

Dr. Rogers—About 250 pounds apiece.

Chairman Lotte—Are there any other questions you would like to ask Dr. Rogers? As I said before, I am sure we all enjoyed his talk very much and I think Dr. Rogers is entitled to a vote of thanks.

. . . It was regularly moved and seconded that Dr. Rogers be given a standing vote of thanks. . . .

The meeting adjourned at 9.15 p. m.

Communication

Pacific Mills, Lawrence, Mass., Feb. 2, 1925.

The Sub-Committee on Light Fastness of the Research Committee of the American Association of Textile Chemists and Colorists has been working for over two years on the problem of standardizing light tests. It was first thought that this could be accomplished by means of an artificial illuminant having the same relative fading action on dyes as is exerted by the sun, and being capable of exact reproduction as regards both the quality and the quantity of the light produced. Unfortunately, no lamp possessing these properties has been discovered to date, and the committee is therefore compelled to fall back on the sun as the source of light.

Since the sun varies constantly in the rapidity of its fading action, due to weather conditions, the height of the sun in the sky, the amount of moisture in the air, etc., it becomes necessary to adopt a standard "fading unit" which may be used to measure the rapidity of its fading action at any particular time. For this purpose the committee is seeking a dye or combination of dyes which when applied to a fabric will produce a color that under the influence of sunlight,

will fade or change shade continuously for a considerable period, so that the end-point when the fading is stopped will be distinct and capable of reproduction. Such a color, to be of practical usefulness, should show a distinct difference in the shade of the faded portion when the total fading action is increased or decreased as little as 10 per cent.

A dyed fabric possessing this property could be exposed simultaneously with any dyed samples whose fastness was to be determined, and when the former had faded to the predetermined end-point, this would indicate that the samples had received one "unit" of sunlight. For dyes faster than the standard sample, it would be necessary to remove the standard at the end of each "unit" and substitute a fresh portion; in this way the fastness of all dyes would ultimately be expressed by figures indicating the number of units of light required to produce a perceptible change.

There is nothing novel in this proposal, as various investigators have published similar schemes from time to time (Scheurer, J. Soc. Ch. Ind., 17:759; Krais, Ch. Abst., 6:1868 and 7:901; Robson, J. Soc. D. & C., 34:185; Hummel, etc., J. Soc. D. & C., 9:219, 10:195, 12:228, 14:237, 16:4; Scott, this Journal, 7:14, Sec. 2; Echtheitskommission, J. Soc. D. & C., 36:590), but the committee in bringing this matter before the dye-consuming public as a whole is hoping to stimulate investigations and discussions which will result in the discovery of a standard fading unit superior to any hitherto published.

If no single dye can be found which fades with sufficient continuity for this purpose, the committee suggests that a combination of a very fast dye and a very fugitive dye may work better, as in this case the change on fading will be one of shade and not merely a gradual lightening of the color. The committee urgently requests anyone who has done or is doing work along these lines and has obtained satisfactory results to communicate at an early date with the undersigned. This is a matter which requires the co-operation of all in order to reach an early solution of this important problem.

WILLIAM H. CADY, Chairman.

COMMUNICATION FROM THE PRESIDENT

For some time there have been published in the columns of the AMERICAN DYESTUFF REPORTER Dyestuff Tables giving, as far as was known, the properties of a considerable number of dyes arranged numerically according to their Schultz numbers. This information has been brought together from many sources, including data given by the manufacturers, in some instances by chemists in the mills who are testing these dyes from time to time and also from special tests which have been made where no information seemed to be obtainable. The data given in these tables is not based upon any special standards of fastness or any one system of dye testing, and for that reason is somewhat indefinite in many cases. It is hoped that as time goes on the Research Committee of the Association may be able to republish some of this data worked out upon the basis of the standard methods which they have adopted. This will, of course, involve considerable work and some expense, and must therefore be deferred until such a time as funds are available for this purpose. Meanwhile, however, it is desirable that every member of the Association as far as possible should check up these tables with the information which he may have in his possession, in order that any positive errors may be corrected and that any differences of opinion may be considered and looked into.

With this in mind, it is requested that every member of the Association as far as possible will follow out this suggestion, as it will in many instances simplify matters at a later date, in case these tables should be revised upon the basis of our own standards.

It is further requested that all members, as well as others who may have occasion to use the tabulation of American dyes in the Year Book, will report any errors or discrepancies which they may find, or any cases where they may question the correctness of the Schultz numbers published. It is only in this way that the list can be made accurate and brought up to date for the 1925 Year Book.

Following this communication you will find a list of all corrections which have been made up to the present time.

L. A. OLNEY, President.

Corrections to Be Made in Tabulation of American Dyes as Published in the 1924 Year Book

Page

141—Benzo Purpurine 10B (A) should be Schultz No. 405 instead of No. 365.

141—Bismarck Brown R (SW) should be Schultz No. 284 instead of No. 283.

143—Chloramanil Black M should be Chloramanil Black N.

143—Chrome Brown SW (BJ) should be Schultz No. 154 instead of No. 159.

144—Chrome Yellow SS (G) has no Schultz number.

145—Cloth Red G (A) should be Schultz No. 224 instead of No. 234.

146—Diamine Black PV Conc. (G) should read Diamond Black PV Conc.

151—Erie Violet 3R (NA) should be Schultz No. 327 instead of No. 527.

151—Erythrosine (A) should be Schultz No. 591 instead of No. 592.

151—Fast Acid Green N (CA) should be Schultz No. 505 instead of No. 504.

156—Naphthanil Blue B Base (DP) should be Schultz No. 408.

158—Oil Yellow T (CD) should be Schultz No. 68 instead of No. 32.

160—Ponsol Blue RP Paste (DP) should be Schultz No. 837 instead of No. 838.

160—Pontachrome Black SW (DP) has no Schultz number.

161—Pontachrome Brown RH Conc. (DP) has no Schutlz number.

161—Pontachrome Green GLO (DP) has no Schultz number.

161—Pontacyl Blue R (DP) should be Schultz No. 565 instead of No. 562.

161—Pontacyl Carmine 2B (DP) has no Schultz number.

161—Pontacyl Flavine FF (DP) has no Schultz number.

161—Ruby PL Conc. (DP) has no Schultz number.

161—Pontacyl Violet 4BL (DP) has no Schultz number.

161—Pontacyl Violet RL has no Schultz number.

162—Pontamine Brown D3G (DP) should be Schultz No. 476 instead of No. 485.

162—Pontamine Brown D3GN (DP) has no Schultz number.

162—Pontamine Brown D3GP (DP) should be Schultz No. 476 instead of No. 485.

162—Pontamine Fast Red 8BL (DP) has no Schultz number.

162—Pontamine Fast Yellow 4GL (DP) has no Schultz number.

162—Pontamine Fast Yellow L2RX (DP) has no Schultz number.

162—Pontamine Fast Yellow L3RX (DP) has no Schultz number.

APPLICANTS FOR MEMBERSHIP

Active

Brainerd, W. E., chemical engineer, Rollins Hosiery Mills, Des Moines, Iowa. Sponsors: L. A. Olney and W. E. Hadley.

Carr, William T., assistant dyer, Lincoln Bleachery & Dye Works, Lonsdale, R. I. Sponsors: E. A. Wilkinson and E. E. Hanke.

Hall, C. Edward, assistant dyer, Belleville Dye Works, Belleville, N. J. Sponsors: H. F. Ruck and D. P. Knowland.

Hopkins, Edward R., chemist, Rentrop Silk Dyeing Corporation, Brooklyn, N. Y. Sponsors: O. H. Genssler and D. P. Knowland.

Nelson, Thomas, professor of textiles, North Carolina State College, Raleigh, N. C. Sponsors: C. H. Stone and J. E. Moore.

Plucker, Jr., Julius, superintendent, Sunbury Converting Works, Sunbury, Pa. Sponsors: H. E. Tillson and J. H. Hennessey.

Steller, John J., secretary and general superintendent, Sunbury Converting Works, Sunbury, Pa. Sponsors: H. E. Tillson and J. H. Hennessey.

Volkmann, Jr., Edward J., chemist, Davis & Quick, Brooklyn, N. Y. Sponsors: William C. Hall and D. P. Knowland.

Walker, Charles P., chemist and demonstrator, Grasselli Dyestuff Corporation, Charlotte, N. C. Sponsors: J. E. Moore and C. H. Stone.

Junior

Brooks, Clyde K., overseer, bleaching and finishing, Kerr Bleaching & Finishing Mills, Concord, N. C. Sponsors: N. R. Vieira and H. W. Ormand.

Graziano, Daniel J., textile colorist, Calco Chemical Company, Bound Brook, N. J. Sponsors: R. R. Sleeper and R. Alvater.

Paradis, Joseph L., student, New Bedford Textile School, New Bedford, Mass. Sponsors: F. E. Busby and A. E. Hirst.

Searell, George W., second hand, silk degumming, National Spun Silk Company, New Bedford, Mass. Sponsors: F. E. Busby and A. E. Hirst.

CHANGES OF ADDRESS

Carey, John H., 515 Morehead Avenue, Greensboro, N. C.

Durgin, W. Ernest, 154 Dudley Avenue, Roslindale, Mass.

Finlay, H. F., 41 Union Street, Holbrook, Mass.

Frick, G. E., 4221 Michigan Avenue, St. Elmo, Tenn.

Hannah, G. K., 162 South Street, Fitchburg, Mass.

Hartley, John, 435 South Church Street, Charlotte, N. C.

Kingman, William A., 29 Arch Street, Framingham, Mass.

Krebs, Charles G., 63 Bradford Avenue, Boston, 3, Mass.

MacIntyre, J. F., 113 High Street, Boston, Mass.

Massarene, James S., Beacon Manufacturing Company, Swannanoa, N. C.

Moore, Robert M., 5320 North Fifteenth Street, Philadelphia, Pa.

Pooker, L. L., Textile Dye House, corner Mount Hohe Avenue and Pearl Street, Bangor, Me.

Raskin, Nathan, 924 East 181st Street, New York City.

Rosenberg, Isidore, 318 Rochester Avenue, Brooklyn, N. Y.

Roun, Carl D., 3 Nelson Street, Webster, Mass.

Tapley, Fred J., 176 North Main Street, Andover, Mass.

Taylor, Oscar C., 316 Andover Street, Lawrence, Mass.
Templeton, G. E., P. O. Drawer 647, Simcoe, Ontario, Canada.
Trimble, Warren W., 69 Ayerigg Avenue, Passaic, N. J.
Twitchell, George W., 274 Eastern Avenue, East Lynn, Mass.
Watson, Warren N., care of U. S. Tariff Commission, Washington, D. C.

WITHDRAWN

Estlow, J. W., Schoolfield, Va.
Flynn, Thomas P., 65 Wheeler Avenue, Edgewood, R. I.
Friedman, Louis, 2386 Watson Avenue, Bronx, N. Y.
Mayer, Ed., 870 East 175th Street, New York, N. Y.
McGlinchey, Joseph, care of Jos. Bancroft & Sons, Wilmington, Del.
Mereness, H. A., General Silk Importing Company, Yokohama, Japan.
Newall, J. D., Arnold Print Works, North Adams, Mass.
Nuttall, Fred, 2504 West Silver Street, Philadelphia, Pa.
Phillips, Fred, Sayles Bleacheries, Saylesville, R. I.
Riley, George, care of Jos. Bancroft & Sons, Wilmington, Del.
Wright, W. P., United States Finishing Company, Providence, R. I.

ASSOCIATION BADGES

The lapel button badge illustrated herewith is worn by members of the American Association of Textile Chemists and Colorists.

The three "rings" are enameled in red, yellow and blue, respectively, and the initials and border are brought out in gold. The general effect is exceedingly attractive.

Badges may be secured at $1.50 each by addressing the Secretary.

WALTER E. HADLEY,
5 Mountain Avenue,
Maplewood, N. J.

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Directing Editor

CLAYTON HOAGLAND
Managing Editor

Published biweekly by
HOWES PUBLISHING CO., INC.
90 William Street, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year; Canadian $5.50; foreign $6.00

Vol. XIV February 9, 1925 No. 2

DOMESTIC COMPETITION AND DYESTUFF PRICES

IN the course of recent conversations with executives of many of the leading dyestuffs manufacturing companies it has been extremely interesting to note that a serious conviction exists to the effect that dyestuff prices must be advanced if even the most modest return is to be made on the capital invested.

During recent years the American dyestuff manufacturing industry has bent itself solidly to the task of producing adequate colors at prices comparable with those current in other dyestuff-producing nations. According to the statistics presented by Dr. Charles H. Herty at the annual meeting of the Synthetic Organic Chemical Manufacturers' Association, American consumers now purchase their dyestuff requirements, on a weighted pound average, at prices as low as or lower than the same products are available elsewhere in the world. Taking into consideration the decrease in purchasing power of the dollar as compared to the pre-war period, these statistics also show that consumers are actually paying less for their dyestuffs to-day than they paid before the war.

In other words, our American dyestuff industry has accomplished all that the most sanguine ventured to predict for it several years ago, and has far surpassed the expectations of those who were skeptically inclined. The fixed desire to demonstrate to dyestuff consumers and the public generally the soundness and efficiency of the industry, coupled with the ever-present menace of foreign competition, has forced domestic dyestuff manufacturers to decrease their prices progressively until, in a great many cases, current quotations are below the level of the actual cost of manufacture.

Obviously, this is a condition which cannot long exist. Prices must be advanced and maintained at a level which permits a reasonable return upon the capital invested. It is undoubtedly true that certain concerns can produce certain products more cheaply than others, but we doubt if there is any single concern manufacturing a wide range of colors which is making what could be termed a satisfactory profit on the basis of present-day dyestuff prices.

Whether or not the various manufacturing companies will voluntarily put into effect an advance in prices which will make their business profitable, or whether or not the seemingly senseless cutthroat competition which has existed during the past year will be continued to the point where many manufacturers will be compelled to give up the struggle—thus furnishing still another demonstration of the old law concerning "the survival of the fittest"—remains to be seen. Unquestionably, there is great potential overproduction of dyestuffs in America to-day, and until some of this productive capacity is converted to other channels it is difficult to see just how prices can be stabilized except by a general recognition of the futility of ruinous competition and a firm refusal to sell products at a loss.

The fact remains, however, that current price levels do not yield a living for anyone engaged in the dyestuff manufacturing business, and if the manufacturers will not of their own volition see the weakness from an economic standpoint of the continued policy of selling below cost, it is certain that some of them, in the not far-distant future, will be compelled to accept defeat and retire from the lists.

This latter eventuality is, of course, greatly to be deplored, and it is our sincere hope that those concerns which have been the chief offenders in the matter of price competition will see the error of their ways and permit prices to rise to a reasonable level—not alone for their own benefit but for the obvious good of the industry as a whole.

CONCERNING "FASTNESS GUARANTEES"

Editor, AMERICAN DYESTUFF REPORTER:

DEAR SIR: Commenting briefly on the editorial "Guaranteeing Fast Dyes" which appeared in your issue of January 26, there is no question but that the demand for colors of guaranteed fastness properties is increasing day by day, and that the general buying public is realizing more perhaps than ever before that it is cheaper in the end to buy the better material whether this applies to dyes or to the quality of the material itself.

As to who shall guarantee the fastness there can be no question, because the only person in position to issue such a guarantee is the person who colors the materials. Obviously the supplier of the dyestuffs has no control whatever over their application, either as to the kind of colors that are applied to any particular materials or as to the methods used in their application. The dyestuff manufacturer's business is to supply to the dyestuff consumer the colors that the consumer wants. If the consumer wants fast dyes he buys them, and if he wants some that are more fugitive he also buys them. As a matter of actual fact, it isn't any of the dyestuff manufacturer's business where or how the consumer uses dyes unless he is asked

for advice or help, in which case he furnishes it to the best of his ability.

Some of the larger textile manufacturers, as is well known, brand their goods either on the selvage or in some unmistakable fashion so that there is no question of a substitution or any question as to just which piece of goods they are guaranteeing.

The fact must not be overlooked, also, that there are many different degrees of fastness, any one of which would give perfect satisfaction under its own particular condition. In fact, it is well known that for certain purposes the color does not require any fastness at all, the whole requirement being brilliancy of shade or something of that sort.

The whole question resolves itself into simply this—that anyone purchasing dyed material of any kind can get fast colors if they insist upon it, because the retailer in turn can insist in the same way with his jobber and the jobber with his manufacturer; and, as before stated, the manufacturer can get fast dyes if he wants them.

Yours very truly,

ELVIN H. KILLHEFFER,
Vice-President, Newport Chemical Works, Inc.

AMERICAN DYES TO LEAD

World leadership in dyestuff production is predicted for our dyestuff industry by a Dutch aniline producer, Frans Franken, who has been visiting the United States during his tour of the world. Mr. Franken draws his conclusions from history. With an eye on the past progress and present accomplishments of the American dye industry he optimistically foretells for it a prosperous future. Pointing out how, before the war, the major countries of the world turned to Germany for their dyes and how, because of the war, a colossal shift came about in dye production which threw the weight upon this country, he foresees continued leadership for America in the dye markets of the world in spite of developments in other dye-producing countries.

HANDSOME VOLUME ISSUED BY FRANKLIN PROCESS

The Franklin Process Company has recently published for distribution to interested parties throughout the textile industry a very handsome volume descriptive of the Franklin Process of yarn dyeing; the book also includes a great amount of material of general interest to the dyeing profession and is profusely illustrated, several of the color plates being remarkably beautiful and instructive.

In particular, there is a plate showing relative fadings of ginghams dyed by the Franklin Process as against a well-known brand of imported English ginghams. The plate shows samples of both fabrics before washing and after having been laundered twenty times, and, whereas the Franklin dyed ginghams show little or no change, the imported ginghams have suffered very materially. Although only four swatches are shown in the plate mentioned, the publisher of The REPORTER recently had an opportunity to examine twenty-five or thirty different samples of the best imported ginghams, which had been laundered for the same number of times as Franklin dyed ginghams of approximately the same colors, and the results were in all cases favorable to the Franklin dyed material. In some cases the imported fabrics showed a truly surprising loss of color.

The volume gives complete technical information in regard to dyeing, glazing and bleaching by the Franklin Process as well as methods of winding, which are designed to effect economy in handling.

One section deals particularly with "Franklin Process Bleaching-Fast Colors" and cites the willingness of the Franklin Process Company to guarantee without question yarns dyed by this process. All in all, it is a volume which anyone concerned with yarn dyeing would do well to read carefully.

NEWPORT DIRECT GREEN B AND DIRECT BROWN CR

Newport Direct Green B and Direct Brown CR are described in two new leaflets issued by the Newport Chemical Works to holders of their binder. Newport Direct Green B is suitable for all classes of cotton material and is described as a good union dyeing color for wool and cotton materials when dyed by the union method. In silk and cotton unions the silk is dyed yellower and stronger. The color is said to be suitable for pure silks, Viscose, Chardonnet and Cuprammonium artificial silks, while Lustron and Celanese are only slightly stained. Wool may be dyed either acid or neutral, but has no particular interest. Good fastness to light for this class of dyestuffs is claimed for this green, as well as fastness to washing. Its fastness to rubbing and steaming is said to be excellent and to weak acids very good.

Newport Direct Brown CR is described as having extensive use for padding and jig work because of its excellent leveling and slow exhausting qualities. It is said to dye well on pure silk and also on Viscose, Chardonnet and Cuprammonium. In combinations of artificial silk and cotton, both fibers are dyed about alike from cold baths. At higher temperature the artificial silk will be dyed heavier. Wool and cotton unions dye well from boiling baths, and silk and cotton unions are dyed a little stronger on the silk. This color will discharge white.

John Campbell & Co., 75 Hudson Street, New York, announce that Percy Wright, for many years associated with the dyestuff industry, has become affiliated with their New England forces. He will make his headquarters at Providence, R. I.

Practical Hints on the Production of Bright Colors on Textile Fabrics

Part IX

Multiple Beam Dyeing Machine—The Operation of the Plant—Its Advantages—Vertical Beam Dyeing Machine—Its Operation and Advantages—Plant for Treating Several Beams—Its Operation —The Bleaching Process—Dyeing Operations—Advantages of the Plant

By RAFFAELE SANSONE

BEAM dyeing, conducted as indicated in the preceding installments of this article, is certainly a great improvement. It offers, however, the serious disadvantage of requiring, when large quantities of goods are being treated, considerable space and labor. These are not always available, especially in the up-to-date works, where, through the ever-increasing cost of raw materials, building, property, etc., such factors must be utilized to the greatest possible degree. By constructing the beam dyeing machine to allow the simultaneous treatment of more than one or two rolls of cloth, a similar method of dyeing could be employed to great advantage, in comparatively small limits of space, and with fairly small employment of labor. An installation constructed on the principle shown in Fig. 1 is of value for this purpose.

This diagram shows a strong horizontal boiler (C), of an iron alloy to resist the action of the dye bath, closed on its front by a heavy door (D), which can be lifted or lowered by an overhead crane, being fitted against the walls of the boiler by screw clamps. Behind this boiler is placed a pumping mechanism (M) for pumping the bath at the bottom, and sending it in at the top in the upper portion of a strong frame (F).

Frame F is of special construction, consisting of a distribution chamber (d), having fitted in it on each side nine beams of cloth (b and c). The dye bath is piped to this construction through a conical tube, which joins with another longer tube on the circulation pump already indicated, making its way through the beams again in case C. Chamber d is fixed on a low wagon (w) running on rails (r), and can be pushed to any other department of the works.

The dye baths are prepared in this case in a vat of wood or enameled iron, heated by a steam coil, or by any other suitable means. This vat is supplied with an agitator worked mechanically. To maintain the bath circulating in case C at the desired temperature, its bottom is supplied with a steam heating apparatus. The bottom of case C contains a large tap for discharging all baths in one or the other of a series of cement cisterns, and all rinsing waters or waste baths into the draining channel of the works. A tube and tap on the pumping mechanism serves to return the baths in case C to the first dye vat for the operations of reinforcement necessary before beginning the treatment of a following lot of goods.

Operation of the Plant

For working the above plant the dyers move frame F into the gray room. Here it is charged with eighteen rolls of cotton cloth wound on separate perforated beams by a special multiple rolling machine, and pushed on the rails up to case C, which has been cleaned thoroughly.

In the vat behind the installation is now prepared the hot dye bath by strengthening an old bath, or by using fresh dyestuff. When this operation has been completed the dyers enter frame F in case C and close door D against the latter, fixing it with the screw clamps already referred to.

They then join the conical tube on the distribution chamber to the tube of the pump and start this in motion, warming the interior of case C, if necessary, by

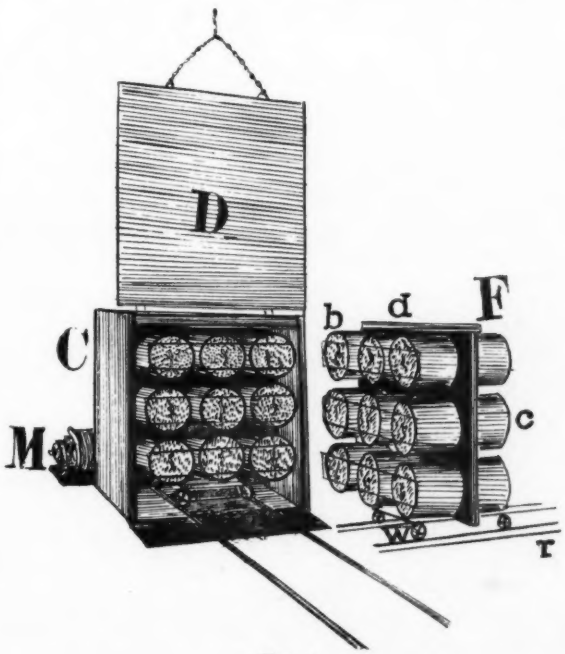


Fig. 1

entering steam in the coil on the bottom. The treating solution is forced in this way to pass continually through the material, leaving the baths more exhausted each time. During the operation the dyers withdraw from a small tap outside case C a small sample of the liquid, keeping it in a glass beaker marked with a 1, out of contact with dirt or dust, and comparing it later with other samples taken at regulated intervals.

When, in this way, they do not note any change, they stop the circulation and discharge the bath to the drainage channel of the works, or return it to the first vat, closing off the steam used for heating. When they have pumped out all of the dye bath they enter water in case C, continuing its circulation, with the assistance of the pumping mechanism (M), until the drain waters are completely exhausted of coloring matter.

When the rinsing operations have been completed, and all possible water has been drawn off, the dyers cause air to pass through the rolls of cloth by opening a tap on the connecting tube of the pump, and a tap on case C to allow all steam to escape through a tube leading outside. This air soon dries the material and frame F can be pushed to the following department, or to the next machines that are to treat its contents.

Advantages of the Installation

The advantages of the above installation can be enumerated as follows:

1. A fair number of cotton pieces can be treated continually, the dyers conducting the moving, charging and discharging operations of frame F while case C treats one lot of goods.

2. The action of the dye baths is strong and effective, owing to the subdivision of the material being treated, and to the rapidity of the circulation taking place.

3. The place occupied by the installation is small, as is also the employment of steam to warm the baths and dry the air.

4. Only moderate motive power and labor are necessary, a good dyer with an assistant being able to survey and work, if matters are well organized, four and even six machines, admitting, of course, that there is another man to prepare the dye baths.

5. The arrangement of the apparatus allows control of the end of the treatment without opening case C or stopping the machine in any way.

6. The baths can be utilized several times, reducing the cost of treatment.

7. The baths can be changed easily, owing to the facilities for withdrawing them from the preparation vat to a deposit cistern, and to the facilities for washing the whole machine at once by the rapid introduction of an abundant quantity of water.

8. Owing to the possibility of keeping the case of treatment closed during the entrance and circulation of the bath, there is no discharge of steam or vapor in the dyehouse, these being eliminated during the rinsing that follows and the drying with hot air.

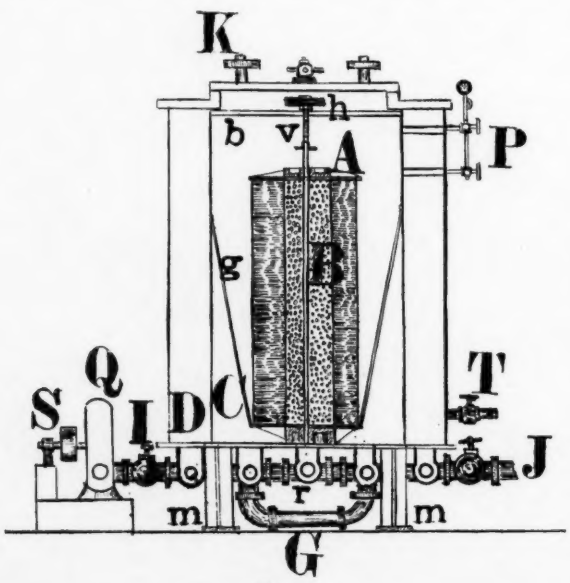


Fig. 2

Vertical Beam Dyeing Machines

Another type of dyeing machine that was introduced in practice some time ago treats the rolls of cotton cloth in a vertical position, with the idea of economizing on space, and with other advantages in view. A plant for boiling out cotton cloth and dyeing it in even colors, where the circulation is not assisted by any rotary or centrifugal pump, is constructed on the principle indicated in Fig. 2.

This diagram shows a high perforated cylindrical shell (A), of material resistant to alkalies; the shell is part of a strong beam, on which two or more pieces of cloth have been wound uniformly. This shell, through a hand crane at a small height above the plant, is placed in a high cylindrical vat (C), of the same material surrounded by a jacket space (D), the whole being supported on four solid iron feet (m, m) embedded in the floor. The upper portion of vat C is closed by cover K, but the lower end is provided with an opening through which the treating fluids can enter and run out. There is a port (r) in the bottom of C with which the aforesaid opening co-operates, which provides the circulation of the liquid through a tube leading to pump Q, driven by the pulley S, and supplied with two taps (I and J). From pump Q the treating fluid passes into the bottom of vat C and shell space D through tube G. All dye baths are entered in the plant by opening tap J. The upper portion of vat C is connected with a pressure gauge (P) placed on the outside, by which the conditions in this vat can be controlled at any time.

The lower portion of shell A is kept, by special arrangements, in communication with the bottom of the dyeing vat, its exact position being fixed by guides (g) arranged to form a sort of conical well. Under such conditions, when the shell descends the bottom is guided with the greatest exactitude. A central rod B, mounted in all the height of the perforated cylinder (A), to which it is solidly fixed serves to fix it firmly against the bottom of vat C, with the assistance of a set screw (v), arranged in a cross bar (b), at the top of vessel C, and put in motion by a hand wheel (h). Overflow arrangements into the jacket space are provided for excess liquid in vat C. By means of a suitable valve, controlled from the outside, this connection may be opened or closed at any time. The shell space (D) is also supplied with a discharge tube T.

The dye bath is pushed in this case into the interior of shell A, and radially through the cotton cloth goods in vat C, or it follows a contrary route, or direction, being pushed radially across the cloth in the interior of shell A. The enveloping jacket space D serves to stock the dye bath which circulates between it and vat C. The system of tubes providing for the circulation of the liquid communicates with the steam tube which accomplishes the injection of steam into the overflowing liquid, in this way maintaining its heat.

Advantages of the Plant

The above plant has the following advantages:

1. The beam charged with the cotton cloth goods can be entered in vessel C from above with the greatest facility, and by simply working the chain of a hand crane running on an overhead runway.

2. Great uniformity is guaranteed in the treatment of the material, which receives the dye liquor evenly throughout its whole height, and not only from its center outwards, but also from its outer to its inner portion.

3. With care the dye bath can be reduced to what is necessary for producing the required shade on the weight of material entered.

4. Because of the facilities for impregnating the material completely, it can be rolled to a high width on the beam, increasing the diameter of its flanges.

5. By conducting the boiling-out and dyeing operations without any intermediate moving of the goods, a certain saving is made, in comparison with some of the horizontal beam dyeing plants using cotton cloth goods that are boiled out in a separate plant.

(To be continued)

A new bulletin describing an industrial type spur gear transformer has been issued by the Hill Clutch Machine & Foundry Company of Cleveland. The folder describes the use and construction of this type of transformer in detail, and is illustrated with diagrams and photographs of the equipment.

A NEW DYEING MACHINE CATALOGUE

The textile machinery products of "a great institution devoted to industries manufacturing and refinishing textiles," are pictured and interestingly described in a new catalog issued by the American Laundry Machinery Company of Cincinnati. The catalog is a collection of nineteen folios or folders of from four to eight pages each, printed on heavy coated paper and bound securely in a handsome loose-leaf cover.

The folios describe and illustrate all of the various types of dyeing machines and other equipment made by the concern—Monel Metal rotary machines, "regular finish" and "silk finish," wooden rotary dyeing, finishing, fulling and washing machines, Humatic extractors and overdriven and underdriven extractors, rotary hosiery presses and copper dye kettles. One folder is devoted to a description of the panel control system for operating the machines on the reversing cylinder principle. Another section illustrates over a dozen installations of the machines themselves, while in a third folio the plants that make them are featured.

The folders that describe the dyeing machines and equipment were designed to give prospective users complete information clearly presented and fully illustrated. The uses, the advantages, the construction and special features and the operation of each machine are in turn described under their respective heads in each folio. The construction of the parts and notable mechanical features are treated at some length, and complete specifications are given for each machine. The illustrations are large and unusually clear for catalog illustrations. In brief, this catalog presents concisely everything about these dyeing machines that the prospective purchaser would want to know.

The photographs illustrating the installations should be of particular interest to every dyehouse man, for here one sees not only the dyeing machines but the particular manner in which a dozen well-known mills have installed that machinery in single units and batteries in their dyehouses.

The section treating of the American Laundry Machine Company and its extensive factories and service gives an interesting picture of this institution and its organization and work. Photographs showing interiors of its plants and offices illustrate the description of its products and the service it renders the textile industry.

The catalog as a whole conveys the impression that the manufacture of dyeing machinery is a highly developed science in which a thousand details relating to the actual dyeing process are involved, and that it is precisely upon these details that the intricate construction of the machinery depends. Evidently, too, it is a science in which art holds its place, for if one were to judge by the photographs in this catalog there is that about a well-balanced, strongly constructed, highly polished metal laundry machine which conveys a sense of mechanical precision and beauty.

Dyestuff Tables

A List of the Principal American-Made Colors with Their Properties and Fastness Characteristics

[NOTE: The publishers of The REPORTER have secured more or less complete data in regard to many of the dyestuffs which are at the present time being manufactured in the United States. As the following material has been brought together from various sources, they realize that errors are quite likely to appear, and it is earnestly requested that any readers who find errors or who are able to give additional information will communicate with the publishers in order that this material may be made as correct, complete and up to date as possible. These tables will appear serially until all colors upon which we have data shall have been covered. The publication of this data was begun in the issue of March 10, 1924.]

CONGO RUBINE

(Schultz No. 313)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Cotton.

USUAL METHOD OF DYEING: With salt..

SHADE: Dull red.

SOLUBILITY: Good.

FASTNESS TO:
- **Acid:** Very slight.
- **Alkali:** Fair.
- **Chlorine:** Very slight.
- **Cross-Dyeing:** Will not stand cross-dyeing.
- **Ironing:** Temporarily redder.
- **Light:** Very slight.
- **Rubbing:** Fairly fast.
- **Sulphur:** Very slight.
- **Washing:** Average for benzidine derivatives.
- **Water:** Bleeds badly in water at 120 deg. Fahr.

ON UNIONS: Cotton-wool-silk: About equal.

ON OTHER MATERIALS: Paper: Used on unsized rag and cellulose. Not good on wood pulp.

COMPETING PRODUCTS: Made in the United States by Calco Chemical Company under name of Direct Garnet; by Cincinnati Chemical Works under name of Direct Rubine.

DIAMINE SCARLET

(Schultz No. 319)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Cotton.

USUAL METHOD OF DYEING: Dyed with common salt and soda ash. (Faster to acid if after-treated with a condensation product of formaldehyde with ortho and para toluidine.)

SHADE: Similar to Benzopurpurine.

SHADE BY GASLIGHT: Yellower and brighter.

SOLUBILITY: Not good with hard water.

LEVEL: Fairly level dyeing.

EXHAUSTS: Fairly well.

FASTNESS TO:
- **Acid:** Not fast unless after-treated; shade turns brown.
- **Alkali:** Fast.
- **Chlorine:** Fair; stands bleaching powder solution ½ deg. Be. for thirty minutes.
- **Cross-Dyeing:** Not suitable.
- **Fulling:** Not suitable.
- **Ironing:** Fast.
- **Light:** Fugitive; slightly better after-treated.
- **Perspiration:** Fast.
- **Rubbing:** Moderate; crocks slightly.
- **Scouring:** Poor; scours off.
- **Steaming:** Fast.
- **Washing:** Very moderate.
- **Water:** Bleeds in water at 104 deg. Fahr.

DYED BY OTHER METHODS: Not suitable for after-treatment with metallic salts on cotton.

ON UNIONS: Cotton-wool unions: The wool is dyed deeper than the cotton in a neutral bath.

ON OTHER MATERIALS: Gloria: Both fibers the same shade. Silk: Dyes in bath of boiled-off liquor broken with acetic acid. Wool: Dyes with Glauber salt and acetate of ammonia. Fairly fast to light. Fast to fulling, washing, perspiration and salt water. Not fast against mineral acids, stoving or alkalies. Crocks slightly on this fiber.

PRINTING: Suitable for printing on wool and silk.

DISCHARGING: Discharges white with hydrosulphite.

COMPETING PRODUCTS: Made in the United States by E. I. du Pont de Nemours & Co.; National Aniline & Chemical Company; Noil Chemical & Color Works.

BORDEAUX

(Schultz No. 320)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Wool.

USUAL METHOD OF DYEING: Neutral or with Glauber salt and sulphuric.

SHADE: Bluish claret shade of red.

SHADE BY GASLIGHT: Brighter.

SOLUBILITY: Good.

LEVEL: Dyes level.

EXHAUSTS: Well.

FASTNESS TO:
- **Acid:** Fast.
- **Alkali:** Fast.

Chlorine: Fugitive.
Fulling: Not fast; bleeds into whites.
Ironing: Fast to hot pressing.
Perspiration: Fast.
Potting: Bleeds.
Rubbing: Fast.
Washing: Bleeds off.
Water: Bleeds into white in water at 104 deg. Fahr.

MACHINE DYEING: Recommended for machine dyeing.

OTHER PROPERTIES: Used for lilac shades on underwear.

ON UNIONS: Cotton-wool unions: The cotton is dyed much bluer than the wool and the color is therefore not suitable.

ON OTHER MATERIALS: Cotton: Dyed cotton with salt a violet shade: Silk: Dyed with boiled-off liquor and acetic or sulphuric acid. Artificial Silk: Dyed a heliotrope shade. Dyed with 10 to 20 per cent Glauber salt at 100 deg. Fahr.

COMPETING PRODUCTS: Made in the United States by Amalgamated Dyestuff & Chemical Works (Selling Agents, John Campbell & Co.); Cincinnati Chemical Works.

TRISULPHON VIOLET
(Schultz No. 322)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Cotton.

USUAL METHOD OF DYEING: With common salt.

SHADE: Similar to S-407, but clearer.

SHADE BY GASLIGHT: Considerably redder.

SOLUBILITY: Good.

LEVEL: Dyes level

EXHAUSTS: Well; S-326 better.

FASTNESS TO:
Acid: Muriatic acid turns it a dark blue.
Alkali: Ammonia turns the shade redder.
Chlorine: Destroys the shade.
Cross-Dyeing: Will not stand cross-dyeing.
Ironing: Fast.
Light: Average for benzidine colors.
Rubbing: Fast.
Scouring: Like all the benzidine colors; bleeds badly.
Washing: In light percentage very good.
Water: Bleeds in water at 104 deg. Fahr.

ON UNIONS: Cotton-wool unions: The wool is dyed much redder than the cotton. In a neutral Glauber salt bath the color hardly goes on the wool. With acetic it exhausts well, but does not dye level. Cotton-silk unions: The silk is redder than the cotton.

ON OTHER MATERIALS: Silk: Dyed a reddish violet shade in an acetic acid bath.

COMPETING PRODUCTS: Made in the United States by National Aniline & Chemical Company; Newport Chemical Works; New England Aniline Works (Selling Agents, U. S. Color & Chemical Company); Amalgamated Dyestuff & Chemical Works; Calco Chemical Company; Commonwealth Color & Chemical Co.

DIANIL BLUE R
(Schultz No. 323)

COMPOSITION: Disazo.

SPECIALLY SUITAELE FOR: Cotton.

USUAL METHOD OF DYEING: Direct from a common salt bath.

SHADE: Dull blue.

SOLUBILITY: Good.

LEVEL: Dyes level.

FASTNESS TO:
Acid: Fast to organic and mineral acids.
Alkali: Shade is altered slightly.
Ironing: Shade altered, but returns on cooling.
Light: Fugitive, like average benzidine color.
Rubbing: Fast.
Steaming: Fast.
Washing: Like average benzidine color.
Water: Like average benzidine color.

DYED BY OTHER METHODS: After-chromed, faster to washing; after-coppered, faster to light.

ON UNIONS: Suitable for cotton-wool union dyeing, also cotton-silk.

PRINTING: Suitable.

DISCHARGING: Discharges white with hydrosulphite.

COMPETING PRODUCTS: Made in the United States by Peerless Color Company; Noil Chemical & Color Works.

OXAMINE VIOLET
(Schultz No. 326)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Cotton and wool.

USUAL METHOD OF DYEING: On cotton, with salt (for light shades add salt); on wool, with Glauber salt and sulphuric.

SOLUBILITY: One and three-quarter ounces per gallon, hot.

EXHAUSTS: Well.

FASTNESS TO (on Cotton):
Acid: Ten per cent sulphuric turns shade bluer.
Alkali: Fast.
Chlorine: Will not stand chlorine.
Cross-Dyeing: Will not stand cross-dyeing.
Ironing: Temporarily redder.
Light: Better than average benzidine.
Rubbing: Color crocks.
Sulphur: Slightly bluer.
Washing: Same as average benzidine color.
Water: Poor against cotton.

FASTNESS TO (on Wool):
Alkali: Bluer with lime.
Fulling: Good fastness.
Ironing: Temporarily redder.

(*Continued on page* 104)

Technical Notes from Foreign Sources

Obtaining Batik Effects

An interesting process for the obtaining of batik effects has been patented in German Patent No. 395,565. This process consists in utilizing for this purpose only colors which dye either in the hot or in the cold, the dyeing operation being carried out in such a manner that the wax does not melt. Under these conditions it is evident that the operation requires quite a long period of time for its completion and that the dye bath is not exhausted. It is now possible to shorten the operation while at the same time increasing the number of coloring matters that can be employed in it by mordanting the batik fabric with chloride of chromium and then removing the wax either by boiling water or by many other means. The textile fabric which has been mordanted in this fashion is then dyed with appropriate coloring matters.

Thus the batik fabric is plunged into a solution of chloride of chromium and allowed to remain there for a period of several hours. Then the textile is dried overnight in air. When it is dry the excess of mordant is removed by washing or by passing the goods through a suspension of chalk, and then the wax is removed from the fabric by treating it with boiling water or with a solvent. Then the fabric may be dyed in the usual manner. The dyeing may be carried out with a 3 per cent Alizarine Red R bath to which there has been added 2 per cent of acetic acid, figured on the weight of the fabric. The dye bath is brought to the boiling point and maintained at that point for 30 minutes.

When the dyeing is carried out under these conditions, it is found that the coloring matter dyes the fabric only at those points where it has been mordanted. One may be certain that the dyed fabrics obtained in this manner are very resistant to the effect of light and water, which is not the case when basic coloring matters are used in the dyeing process. It is also evident that it is possible to increase the fastness of the colors by passing the fabric through a solution of tartar emetic.

Indigo Blue Fast to Bleaching

In the dyeing of embroidery cotton, cotton thread, or woven articles of various sorts, the dyer wants a blue which is fast to bleaching of an Indigo Blue, when the operations are carried out in the proper fashion, so that only the tone of the Indigo color is lightened, while the Indigo retains its greenish shade, which distinguishes it from all other blues.

In order to obtain an Indigo dyed fabric which is as fast as possible, it is necessary to carry out the dyeing operation along certain definite lines. The first condition that is essential is that the cloth be made to pass through the dye vat as many times as possible. The cotton thread may in this manner be perfectly boiled out so that the dye itself penetrates into the very internal structure of the cotton fiber. The mechanism of the dyeing operation when Indigo Blue is employed as the dyestuff consists in the deposition of extremely fine particles of Indigo on the fiber. The smaller these particles are the better they adhere to each other and the less the proportion of coloring matter in the dye bath and the smaller the particles of indigo formed by oxidation on leaving the bath. Hence, in order to obtain a blue that is fast to bleaching and other influences, it is necessary to use a weak dye liquor and to make the fabric pass through the bath many times.

It is necessary to produce a blue that is almost black in order to obtain a fairly good, clear blue after the bleaching operation has been carried out on the fabric. This bleaching may be called a semi-bleaching because the white obtained is not a pure white, and woven articles as well as handkerchiefs cannot stand complete bleaching.

It is necessary to pass the cloth from 8 to 10 times through the dye liquor, and after the fourth or fifth passage the fabric is passed through an acid bath, then washed and completely dried. During that process a part of the Indigo that has been deposited on the surface of the fibers disappears, and the following passages of the cloth through the bath permit the dye to penetrate more readily into the interior of the fibers. Then the cloth is passed through a concentrated liquor which has for its purpose the removal of the Indigo which does not adhere well to the fibers. In order to finish the operation the fabric is passed through an acid bath, then it is washed and finally dried.

Because of the labor involved and the complicated character of the repeated impregnations and drying operations, this process was found to be very expensive, and it is possible to say that in spite of the special precautions which may be taken during the bleaching operation and no matter how weak the solution of the chlorine bleaching liquor is used, about two-thirds or three-quarters of the Indigo is lost during the operation.

The greatest part of the Indigo that is lost in this manner comes about through the friction to which the fabric is subjected during the process of bleaching. Different processes have been recommended for protecting the Indigo against friction. For example, the fabrics may be treated with silicate of soda, being coated with an insoluble silicic acid film right over the color. It may also be treated with an acetate of aluminum which yields a hydrate of alumina, or with tannin and albumen which is fixed on the fibers.

The latter process seems to be the most efficacious, but it is more costly than any of the others. The albumen process consists in passing the thread by hand through a container holding approximately 5 parts of water and 4 parts of albumen, wringing out the water and drying by

exposure to air and then steaming with steam at one kilogram pressure. When the process is carried out in this manner, it is possible to dye the cloth a clear color before bleaching.

In actual practice it is customary to replace the Indigo Blue by Indanthrene Blue which gives a color much more fast to the semi-bleaching process. It is possible that it will not be long before Indanthrene Blue will replace Indigo Blue entirely. (Wascherei Centralblate, 1924.)

Effect of Formaldehyde on Wool

A recent lecture delivered before the Textile Institute of London considered the chemistry of the waterproofing process and mention was made of a recent discovery relating to the effect of formaldehyde on wool. This reagent has a hardening effect on the fiber, which after being treated with solutions up to 4 per cent of formalin, showed, among other valuable properties, increased resistance toward steaming. The suggestion was made that it would yet be possible to proof wool without serious detriment by the superheated steam process.

Another process described was a combined chlorination and waterproofing process in which the wool was treated with definite quantities of hydrochloric acid, chloride of lime and water. The treatment involved boiling with beeswax soap solution, castile soap solution, drying and calendering. The resulting cloth was soft, lustrous and waterproof.

The lecturer also mentioned the various materials that are used in the waterproofing of fabrics and the advantages of each chemical, soap, resin, etc., for this purpose.

Apparatus for Dyeing Bobbins of Combed Wool

The apparatus comprises two rows of a number of independent vertical cylindrical containers which are situated within a dye bath, each having a lower perforated base and also a perforated cover, which presses downward on the bobbins which are packed vertically within the container. These perforated covers are attached to a single member by which they may be raised or lowered simultaneously. The upper and lower parts of the containers are connected by dye-liquor conduits to a pump, and dyeing is effected by continuously circulating a liquor upward through the bobbins. Arrangements are made whereby any number of containers may be cut out of the circulating system. This apparatus has been patented in British Patent No. 211,370.

Making Artificial Silk Threads

According to British Patent No. 211,691 artificial silk threads of a predetermined degree of fineness are obtained from solutions of cellulose in cuprammonium hydroxide solution if the sprays are fed hot directly from a common supply pipe, but by means of, for example, cogwheel pumps of equal quantities of the spinning solution to each spray irrespective of the pressure in the common spray pipe.

According to British Patent No. 212,068 in the production of artificial silk threads from solutions of cellulose in cuprammonium hydroxide solution by the stretch spinning process, threads of more uniform size and of a greater degree of fineness are obtained if the relatively thick threads leaving the precipitating bath are caused to travel through the open air for a distance at least equal to and preferably greater than their length of travel in the precipitating bath, so that the stretching operation is effected chiefly in air, and the length of thread undergoing the stretching operation is as large as possible, consistent with the limits of strength of the unhardened threads. The stretched threads are then wound, preferably on a reel having a diameter at least equal to the length of travel of the thread through the precipitating bath, and treated with the hardening agent from a spray so arranged that the threads travel almost completely round the reel before that come into direct content with the hardening solution. In this way the threads are gradually exposed to the action of the hardening liquid, and as a result show a diminished tendency to stick together. If desired, the hardening may be effected before the threads are wound.

Cleansing Wool

One of the methods used in the cleansing of raw wool is to agitate the wool with various dry powders. It is stated in French Patent No. 564,104 that gypsum, which has been completely ignited, when placed in contact with the greasy substances that are present in the raw wool, will remove these entirely from the wool, not only from the surface of the wool fibers but also from the interstices between the fibers.

The calcined gypsum does not form clods in the raw wool as the humidity that it contains is without effect on it. It is necessary to calcine the gypsum at a temperature of at least 500 deg. Cent. for a period of two hours, but in the majority of cases the calcination must be carried out at a temperature of 700 deg. Cent. for 48 hours. The gypsum is then screened.

The powder thus obtained may be distributed over the raw wool by an agitating apparatus, and is then removed by means of a dust remover. It is advantageous to carry out this operation in the usual apparatus used for cleansing wool and then placing the wool in a chamber and heating to a temperature between 35 and 40 deg. Cent.

Action of Heat on Cotton Fabrics

In a recent meeting of the Manchester Section (England) of the Society of Dyers and Colourists, a paper was read on some further observations relating to the action of heat on cotton fabrics. In this paper it was shown that when bleached cotton was heated for prolonged periods (up to 2,000 hours) to a temperature of 90 deg. Cent., the material was found to behave differently according as it was exposed in open, sealed, or evacuated and sealed glass tubes. In all cases the material had deteriorated in strength, the least affected being that in the evacuated tubes; nevertheless the latter specimens were scorched

or browned more than the others. The deterioration was shown to be due partly to the action of heat *per se* and partly to oxidation. It was brought out that the danger point of a flat iron was estimated to be in the vicinity of 250 deg. Cent.

Behavior of Alumina Toward Dyestuffs

This was the subject of an address recently made before the Society of Dyers and Colourists in Manchester. According to the speaker, Dr. Wood, it had been previously shown that the behavior of titanic acid and stannic acid toward dyestuffs was influenced by the mode of preparation of the compounds in question. This influence was attributed to the amphoteric character of the substances, which made it possible for them to absorb either acid or alkali from the solution in which they were being produced, thus giving rise to products which are capable of taking up acid dyes or basic dyes respectively.

It was thought that similar results might be obtained with other substances of an amphoteric character. Experiments which have been carried on recently on the behavior of what had been termed hydrated alumina (on account of its water content being variable and the fact that there was no very definite compound) were described. These showed the difficulty of preparing hydrated alumina which was free from impurities. In many cases the behavior of the product toward dyestuffs was influenced by the impurities present. Hydrated alumina had more affinity for acid than for basic dyestuffs, and the evidence indicated that with the former class of dyes the process of fixation of the color was one involving exchange between the acidic impurities in the hydrated oxide and the acid of the dyestuff.

Color Discharge Effects with Resorcin Green

The following process is used for producing color discharge effects with the aid of Resorcin Green:

The goods are first slop-padded in a bath containing 132 grams of resorcin. Then they are diazotized with the aid of 264 c.c. of hydrochloric acid, 168 grams of sodium nitrite with the simultaneous addition of ice water. After diazotization of the color has been completed, the goods are treated with a liquor consisting of one liter of ammonia and 1,250 grams of potassium ferricyanide to which the required amount of water has been added. Then white and colored resist preparations which are made from the color lake and albumen with the addition of potassium sulphite of 45 deg. Be. concentration, containing 200 to 250 c.c. to the kilogram of the color resist. In the case of white resist a certain amount of sodium citrate was added. The goods were then steamed, washed with lukewarm water and then with cold water and are led through a cold bath containing hydrochloric acid, about 8 c.c. of the acid to one liter of the water. The goods are thereafter washed and dried. A certain amount of Prussian Blue is formed during the acidification, with the result that the tone of the background becomes a bright green. According to the quantity of ferricyanide liquor that is employed in this process, the shade can be made to vary from a brown olive to a pure green.

For further details see Soc. Ind. de Mulhouse, Rev. Gen. Tein., Impr., Blanch. Appret., 1924, page 637.

Minute Structure of Artificial Silk

An interesting investigation has been made into the matter of the minute structure of artificial silk. The results of this investigation are to be found in an article which was published in the German magazine, Kolloid Zeitung, 1924, 35, pages 201 to 202.

There it is stated that contrary to previous impressions, it is now established that all artificial silk fibers, with the exception of those of cellulose acetate, show when examined with X rays the spectrographic diagram of a crystalline structure symmetrically disposed. Both as regards position and intensity of the interference phenomena the diagrams of the regenerated cellulose artificial silks are similar to those of mercerized cotton. The difference between the diagrams of fibers produced by different processes consists chiefly in the different lengths of the circular interference stripes, that is, in the more or less perfect disposition of the crystallites relatively to the fiber axis. When the crystallites are irregularly disposed a ring diagram is obtained, and when they are disposed parallel to the fiber axis with a constant crystallographic arrangement, a point diagram. The artificial silks show intermediate types of diagrams consisting of rings which are definitely thickened at those places where the interference points would lie if the arrangement were entirely parallel.

Fast Colors on Vegetable Fibers

Vegetable fibers are treated with condensation products which are obtained by the action of aliphatic aldehydes upon primary aromatic amines in the presence of acids. After diazotization, the colors are developed by treatment with solutions of amines or phenols. Alternatively, the condensation products may be diazotized before application to the fibers, the colors being subsequently developed as before. The dyeings are fast to washing and boiling. The best results are obtained by using condensation products of amines in which the para position is unoccupied, or of polynuclear bases having a single nucleus attached to the position para to the amino group, such as benzidine and diaminodiphenylmethane. (German Patent No. 402,502.)

James S. Massarene, chemist at the Beacon Manufacturing Company, New Bedford, Mass., has been appointed superintendent of dyeing at the Southern branch of the Beacon Manufacturing Co. in Swannanoa, N. C.

VAT DYE RATIOS BETWEEN PASTE AND POWDER

(*Concluded from page 78*)

Schultz No.	Name of Dye	Ratio of Paste to Powder
904	Helindone Brown G 14 2/7 Per Cent Paste	1 to 7
836	Helindone Brown 3GN 14 2/7 Per Cent Paste	" 7
902	Helindone Brown 2R 14 2/7 Per Cent Paste	" 7
903	Helindone Brown 5R 14 2/7 Per Cent Paste	" 7
907	Helindone Fast Scarlet C 10 Per Cent Paste	" 10
915	Helindone Fast Scarlet R 10 Per Cent Paste	" 10
892	Helindone Green G 10 Per Cent Paste	" 10
921	Helindone Gray 2B 20 Per Cent Paste	" 5
914	Helindone Orange 4 14 2/7 Per Cent Paste	" 7
835	Helindone Orange GRN 10 Per Cent Paste	" 10
913	Helindone Orange R 10 Per Cent Paste	" 10
917	Helindone Red B 20 Per Cent Paste	" 5
918	Helindone Red 3B 20 Per Cent Paste	" 5
	Helindone Rose R Extra 16 2/3 Per Cent Paste	" 6
916	Helindone Scarlet S 10 Per Cent Paste	" 10
920	Helindone Violet B 20 Per Cent Paste	" 5
	Helindone Violet BH 20 Per Cent Paste	" 5
920	Helindone Violet 2B 20 Per Cent Paste	" 5
920	Helindone Violet R 20 Per Cent Paste	" 5
810	Helindone Yellow 3GN 20 Per Cent Paste	" 5
810	Helindone Yellow RN 20 Per Cent Paste	" 5
	Helindone Yellow 3RN 20 Per Cent Paste	" 5
	Hydron Black B 30 Per Cent Paste	" 3 1/3
	Hydron Blue B 30 Per Cent Paste	" 3 1/3
748	Hydron Blue G 30 Per Cent Paste	" 3 1/3
748	Hydron Blue R 30 Per Cent Paste	" 3 1/3
	Hydron Bordeaux B 12½ Per Cent Paste	" 8
	Hydron Bordeaux R 6¼ Per Cent Paste	" 16
	Hydron Brown G 16 2/3 Per Cent Paste	" 6
	Hydron Brown R 16 2/3 Per Cent Paste	" 6
	Hydron Dark Blue G 30 Per Cent Paste	" 3 1/3
	Hydron Dark Blue GG 30 Per Cent Paste	" 3 1/3
	Hydron Green B 12½ Per Cent Paste	" 8
	Hydron Green G 16 2/3 Per Cent Paste	" 6
	Hydron Navy Blue C 30 Per Cent Paste	" 3 1/3
	Hydron Olive GN 16 2/3 Per Cent Paste	" 6
	Hydron Olive R 12½ Per Cent Paste	" 8
	Hydron Orange R 10 Per Cent Paste	" 10
	Hydron Pink FB 16 2/3 Per Cent Paste	" 6
	Hydron Pink FF 16 2/3 Per Cent Paste	" 6
	Hydron Scarlet BB 16 2/3 Per Cent Paste	" 6
	Hydron Scarlet 3B 16 2/3 Per Cent Paste	" 6
	Hydron Violet B 20 Per Cent Paste	" 5
	Hydron Violet R 20 Per Cent Paste	" 5
	Hydron Yellow NF 16 2/3 Per Cent Paste	" 6
	Hydron Yellow R 20 Per Cent Paste	" 5
765	Indanthrene Black B 12½ Per Cent Paste	" 8
765	Indanthrene Black BB 14 Per Cent Paste	" 7 1/7
840	Indanthrene Blue 3G 10 Per Cent Paste	" 10
873	Helindone Brown AN 10 Per Cent Paste	" 10
	Indanthrene Blue BCS 20 Per Cent Paste	" 5
843	Indanthrene Blue GC 10 Per Cent Paste	" 10
842	Indanthrene Blue GCD 8 1/3 Per Cent Paste	" 12
841	Indanthrene Blue GGSP 10 Per Cent Paste	" 10
838	Indanthrene Blue RS 10 Per Cent Paste	" 10
	Indanthrene Blue RZ 10 Per Cent Paste	" 10
	Indanthrene Blue RC 14 Per Cent Paste	" 7 1/7
765	Indanthrene Blue Green B 12½ Per Cent Paste	" 8
827	Indanthrene Bordeaux B Ex. 12½ Per Cent Pst.	" 8
828	Indanthrene Bordeaux B 12½ Per Cent Pst.	" 8
	Indanthrene Brill. Blue R 12½ Per Cent Pst.	" 8
867	Indanthrene Brown B 11 Per Cent Paste	" 9.09
	Indanthrene Brown RR 12½ Per Cent Paste	" 8
	Indanthrene Brown 3R 12½ Per Cent Paste	" 8
828	Indanthrene Claret B 12½ Per Cent Paste	1 to 8
827	Indanthrene Claret B Ex. 12½ Per Cent Paste	" 8
813	Indanthrene Copper R 12½ Per Cent Paste	" 8
763	Indanthrene Dark Blue BO 25 Per Cent Paste.	" 4
	Indanthrene Dark Blue BGO 25 Per Cent Paste	" 4
760	Indanthrene Gldn. Orange G 12½ Per Cent Pst.	" 8
761	Indanthrene Gldn. Orange R 12½ Per Cent Pst.	" 8
761	Indanthrene Gldn. O'nge RRT 20 Per Cent Pst.	" 5
765	Indanthrene Green B 12½ Per Cent Paste	" 8
	Indanthrene Green G 25 Per Cent Paste	" 4
848	Indanthrene Gray B 12½ Per Cent Paste	" 8
	Indanthrene Gray 3B 12½ Per Cent Paste	" 8
791	Indanthrene Olive G 10 Per Cent Paste	" 10
812	Indanthrene Orange RT 12½ Per Cent Paste	" 8
	Indanthrene Pink B 20 Per Cent Paste	" 5
	Indanthrene Pink BS 20 Per Cent Paste	" 5
831	Indanthrene Red BN Extra 12½ Per Cent Pst.	" 8
826	Indanthrene Red G 12½ Per Cent Paste	" 8
830	Indanthrene Red R 12½ Per Cent Paste	" 8
871	Indanthrene Red Violet RRN 12½ P. C. Pst.	" 8
762	Indanthrene Scarlet G 12½ Per Cent Paste	" 8
767	Indanthrene Violet RR Ex. 12½ Per Cent Paste	" 8
764	Indanthrene Violet RT 12½ Per Cent Paste	" 8
768	Indanthrene Violet B Ex. 25 Per Cent Paste	" 4
832	Indanthrene Violet BN Ex. 25 Per Cent Paste	" 4
832	Indanthrene Violet RN Ex. 25 Per Cent Paste	" 4
766	Indanthrene Violet R Ex. 25 Per Cent Paste	" 4
849	Indanthrene Yellow G 12½ Per Cent Paste	" 8
849	Indanthrene Yellow R 12½ Per Cent Paste	" 8
	Indigo C 20 Per Cent Paste	" 5
	Indigo G 20 Per Cent Paste	" 5
880	Indigo MLB/2B 20 Per Cent Paste	" 5
881	Indigo MLB/4B 20 Per Cent Paste	" 5
882	Indigo MLB/5B 20 Per Cent Paste	" 5
883	Indigo MLB/6B 20 Per Cent Paste	" 5
879	Indigo MLB/R 20 Per Cent Paste	" 5
874	Indigo 20 Per Cent Paste	" 5
888	Indigo MLB/T 20 Per Cent Paste	" 5
	Indigo Pure E 20 Per Cent Paste	" 5
	Thioindigo Black B 20 Per Cent Paste	" 5
896	Thioindigo Blue 2G 20 Per Cent Paste	" 5
	Thioindigo Blue 3GN 20 Per Cent Paste	" 5
904	Thioindigo Brown G 20 Per Cent Paste	" 5
902	Thioindigo Brown R 20 Per Cent Paste	" 5
	Thioindigo Brown 2R 20 Per Cent Paste	" 5
903	Thioindigo Brown 3R 20 Per Cent Paste	" 5
	Thioindigo Green G 20 Per Cent Paste	" 5
921	Thioindigo Gray 2B 20 Per Cent Paste	" 5
913	Thioindigo Orange R 20 Per Cent Paste	" 5
910	Thioindigo Pink AN 20 Per Cent Paste	" 5
910	Thioindigo Pink BN 20 Per Cent Paste	" 5
912	Thioindigo Red B 20 Per Cent Paste	" 5
917	Thioindigo Red BG 20 Per Cent Paste	" 5
918	Thioindigo Red 3B 20 Per Cent Paste	" 5
906	Thioindigo Scarlet G 20 Per Cent Paste	" 5
907	Thioindigo Scarlet 2G 20 Per Cent Paste	" 5
905	Thioindigo Scarlet R 20 Per Cent Paste	" 5
916	Thioindigo Scarlet S 20 Per Cent Paste	" 5
	Thioindigo Violet B 20 Per Cent Paste	" 5
920	Thioindigo Violet 2B 20 Per Cent Paste	" 5
900	Thioindigo Violet K 20 Per Cent Paste	" 5
	Thioindigo Violet 2R 20 Per Cent Paste	" 5
913	Thioindigo Yellow 3GN 20 Per Cent Paste	" 5
912	Vat Red B 20 Per Cent Paste	" 5

The Baltimore Yarn Dyeing Corporation has been organized at Baltimore, Mr., with headquarters at 1007 So. Pratt Street, to operate a local dye works. The company is capitalized at $60,000. Frank A. and George Schleunes are the principal incorporators.

22235

RECENT PATENTS

Manufacture of Fabrics Containing Artificial Silk

(1,511,741; October 14)

William Marshall, Cheadle Hulme, England

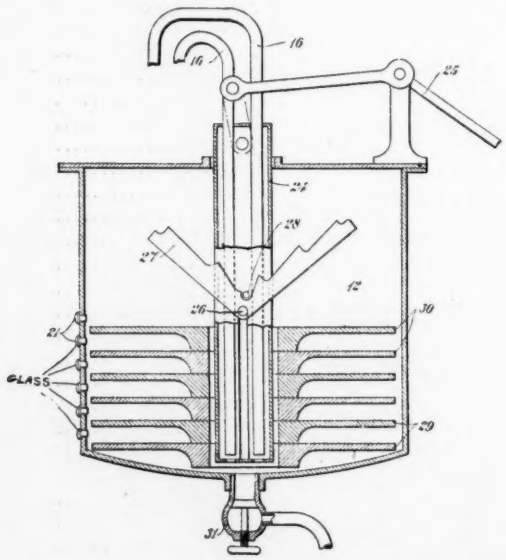
The process of manufacturing fabrics of mixed artificial silk and mercerized cotton, which comprises weaving the fabric from incompletely mercerized cotton yarn, and acetyl cellulose yarn, and then subjecting the fabric to the action of a caustic alkali mercerizing agent, wherein the action of such agent upon the acetyl cellulose is substantially prevented by maintaining the caustic alkali at mercerizing strength at low temperatures.

Apparatus for Delivering Measured Quantities of Liquids

(1,511,986; October 14)

Frederick William Stanley, Cirencester, England

In combination with a container, a pipe for delivering liquid thereto under pressure, said pipe serving to



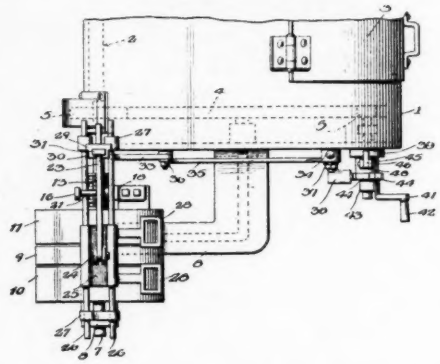
siphon from the container liquid above the open end of the pipe on relief of such pressure, a tube slidably mounted in the container and carrying within the same the open end of said pipe, and means for adjusting said tube in the container.

Reversing Mechanism and Safety Stopping Device for Dyeing Machinery

(1,511,988; October 14)

Reuben Norton Towers, Rome, Ga.

A mechanism of the character described comprising a rotatable cylinder carrying a gear, a pinion in mesh with the gear by which the cylinder is power-driven, a racking pinion engageable with the gear to rotate the cylinder by hand, power mechanism by which the



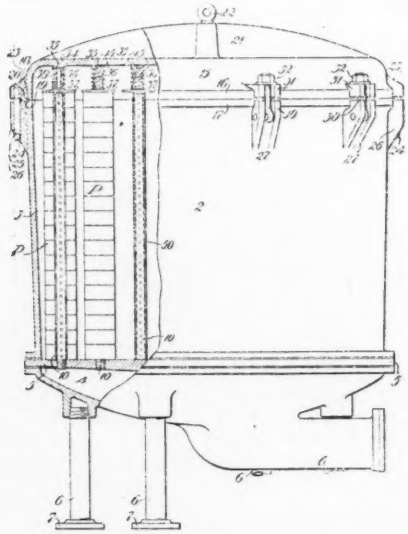
driving pinion is operated, and means to prevent the engagement of the racking pinion with said gear while the driving pinion is power-driven and also to prevent the application of driving power to said pinion while the racking pinion is in engagement with said gear.

Dyeing Apparatus

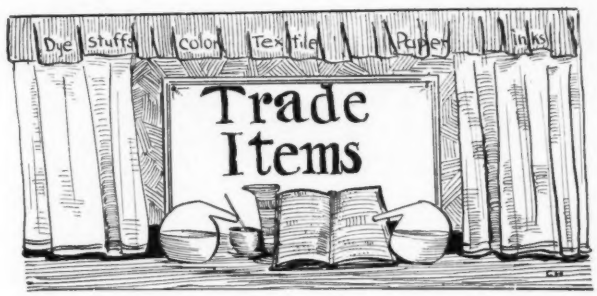
(1,511,380; October 14)

Wlliam A. Traver, Providence, R. I., assignor to the Franklin Process Company, Providence, R. I.

In an apparatus of the type specified, the combination of a kier, a plurality of vertical standpipes in the kier adapted to hold yarn packages in stacked relation



thereon, a cover for the kier, resiliently operated compression means carried by the cover to adapt them to bear against the end packages on the standpipes, and sleeve-like closures for covering the portions of the standpipes not utilized for packages, said closures having end flanges to bear against the topmost packages on the standpipes.



BURKE JOINS BIGELOW-HARTFORD

Henry B. Burke, who for nearly eight years has been associated with the Hussong Dyeing Machine Company in the capacity of sales engineer and chemical consultant, has accepted a position with the Bigelow-Hartford Carpet Company in their Thompsonville, Conn., plant. It is understood that Mr. Burke will have supervision of some important chemical work of a research nature.

Expansion of the Wayne Tank & Pump Company, of Fort Wayne, Ind., to embrace the manufacture of domestic oil burners has resulted in the reorganization of the sales executive personnel.

W. G. Zahrt, formerly sales manager of the pump and tank division, becomes director of sales, in charge of the sales organizations, of all divisions of the company, including pump and tank, water softener and oil burner.

R. G. Elwell will continue in charge of the water softener sales as well as of the oil burner section.

NEW CHEMISTRY COURSE

What will doubtless be a very novel and valuable course of five lectures in general chemistry as related to industry opened February 6th at the College of the City of New York under the direction of Dr. F. E. Breithut, professor of chemistry at the college. The course will be based on the book, "Chemistry in Industry," recently published by the Chemical Foundation and reviewed in these columns. Complete details of the course, which is planned primarily for salesmen and others connected with the chemical industry, can be obtained from the Salesmen's Association of the Chemical Industry, under whose auspices the course is given.

The Hanes Dyeing & Finishing Company, Winston-Salem, N. C., will install two separate drainage systems for its plant under construction there. Lockwood, Greene & Co., Charlotte, are the engineers.

Adam Hilger, Inc., 753 Camden Road, London, England, has recently issued an illustrated catalog of Michelson Echelon diffraction gratings, Lummer-Gehrcke parallel plates, spectrometers, goniometers, spectrographs, spectroscopes, spectrophotometers, colorimeters, etc, and accessories for all similar apparatus. The catalog has a unique tab index which shows at a glance the contents of each section. Each instrument is illustrated and its use and construction fully described.

DU PONT ISSUES NEW GROUP OF COLORS FOR SILK

The development of an important group of dyestuffs known as Setamine colors is announced by the Dyestuffs Department of E. I. du Pont de Nemours & Co. The colors have been placed on the market to meet the requirements of concerns engaged in the dyeing of silk goods in the piece, either tin-weighted or pure. The proper dyeing of silk piece goods previously weighted with tin presents difficult problems and involves as an important consideration the use of special dyestuffs and methods of procedure.

The Setamine colors are especially recommended for the dyeing of tin-weighted silk piece goods as self-shades or in combination. They possess good level-dyeing properties, exhaust well, and are fast to finishing processes. In addition, the resistance to light, water, washing with soap at moderate temperatures, perspiration and hot pressing is very good.

Especially important in this series are the Setamine Blues and Blacks because of the large volume of navy and black piece goods required for ladies' wear. The series is quite complete in range of shades.

JOHN CAMPBELL'S MESSAGE TO PURCHASING AGENTS

A new booklet, entitled "A Message to Purchasing Agents," has been issued by John Campbell & Co. It tells of nearly half a century of experience in the manufacture of dyestuffs and textile chemicals. The user of textile chemicals will find briefly described in its sixteen pages the complete "Camel" line, embracing everything from stripping compounds, mordants, formic acid and fulling, scouring, bleaching and sulphonated castor oils, to anti-chlors, cream softeners, finishing pastes, sizing compounds, blues and developers.

TWO NEW NOIL SCARLETS

Noil Chemical & Color Works announce that they are the sole American producers of a new scarlet—Noil Direct Fast Scarlet 3B—notable for its brilliance, clear white discharge and fastness to light, washing and steaming, and specially suitable for tin weighted silk. This same firm has brought out a second scarlet—Noil Direct Scarlet B, of an unusual brilliant shade, also adapted for tin weighted goods and possessing level dyeing properties and excellent fastness to light and hot pressing.

DYESTUFF TABLES

(*Continued from page 97*)

Light: Fair.
Rubbing: Color crocks.
Sulphur: Slightly bluer.
Water: Very moderate against silk; fair against wool.

DYED BY OTHER METHODS: After-chromed; little change in properties.

ON UNIONS: Cotton-silk from salt bath at boil. The silk is much redder and slightly lighter than the cotton.

ON OTHER MATERIALS: Silk: Dyed in a slightly acid bath. Fast to water on this fiber.

PRINTING: On cotton, suitable.

COMPETING PRODUCTS: Made in the United States by Newport Chemical Works.

DIAMINE VIOLET N
(Schultz No. 327)

COMPOSITION: Disazo.

SPECIALLY SUITABLE FOR: Cotton.

USUAL METHOD OF DYEING: Common salt and soda ash.

SHADE: Bright reddish violet.

SHADE BY GASLIGHT: Redder.

SOLUBILITY: About 10 grains per liter.

LEVEL: Dyes level.

EXHAUSTS: Well.

FASTNESS TO:
Acid: Fast against acetic; sulphuric 1/10 turns the shade bluer.
Alkali: Fair; shade turns somewhat redder.
Chlorine: Destroyed.
Ironing: Fast.
Light: Fairly fast for a benzidine color.
Rubbing: Fast.
Washing: Not fast.
Water: Not fast.

SENSITIVE TO METALS, LIME: Not particularly sensitive to copper and iron.

MACHINE DYEING: Suitable for pad dyeing.

OTHER PROPERTIES: Fast against caustic soda and adapted for crêpe effects.

ON UNIONS: Cotton-wool unions: The cotton is bluer than the wool. Cotton-silk unions: The silk is redder than the cotton.

ON OTHER MATERIALS: Silk: Dyeings are not fast to water on this fiber. Artificial silk: Suitable.

DISCHARGING: Discharges white with sulphoxalates.

COMPETING PRODUCTS: Made in the United States by American Aniline Products, Inc.; Central Dyestuff & Chemical Company; Cincinnati Chemical Works; E. I. du Pont de Nemours & Co.; National Aniline & Chemical Company; Newport Chemical Works; Noil Chemical & Color Works; Palatine Aniline & Chemical Corporation (Selling Agents, F. E. Atteaux & Co.); Amalgamated Dyestuff & Chemical Works.

W. L. Glensing has resigned from his position as advertising and sales promotion manager of the National Aniline & Chemical Company, and is at present devoting his time to some special work for the Chemical Color and Oil Record. His future plans have not definitely been made, but it is understood that he intends shortly to enter sales promotion work of broader scope.

DYES AND CHEMICALS WANTED

We buy for spot cash surplus and odd lots of chemicals, oils, dyes, intermediates, solvents, gums, glues, waxes and any item of a chemical nature. Republic Chemical Company, 303 Pearl Street, New York City.

EXPERIENCED HELPER

Young man, graduate in chemistry of the German Polytechnic at Karlsruhe, and having had several months' experience in the application laboratories of Fried. Bayer & Co. at Leverkusen, seeks an opportunity to enter a dyehouse as second hand or helper where he may have an opportunity to familiarize himself with American methods. Address Box 277, American Dyestuff Reporter.

CHEMIST

Young German graduate chemist with good knowledge of English, at present employed with small dyestuff manufacturers, desires position in application laboratory where he may gain experience leading to becoming a salesman Address Box 284, American Dyestuff Reporter.

COTTON DYER

Cotton dyer wants position. Experienced with vat, direct, developed and sulphur dyes. Graduate chemist. Address Box 285, American Dyestuff Reporter.

LABORATORY ASSISTANT

Wanted—Laboratory assistant with good experience in color matching on all kinds of textile materials. State full particulars. Confidential. Address Box 286, American Dyestuff Reporter.

DU PONT DYESTUFFS

Ponsol Brilliant Blue R Paste

A bright reddish, vat blue

This latest addition to the Ponsol series is somewhat redder and brighter than Ponsol Blue RS Paste which heretofore has been our reddest vat blue.

Besides shade and brightness, Ponsol Brilliant Blue R Paste possesses a degree of resistance to chlorine which permits its use in the dyeing of all types of fabrics where fastness to severe laundering is essential.

E. I. DU PONT DE NEMOURS & CO., INC.

Dyestuffs Department

WILMINGTON DELAWARE

EDWARD C. FOSTER

274 WASHINGTON ST. PROVIDENCE, R. I.

IMPORTER AND
MANUFACTURERS' AGENT

Specializing in Colors Manufactured by

LEOPOLD CASSELLA & CO.

FRANKFURT o, M

DYESTUFFS

AZONINE COLORS
Used on Acetate Silk
Both Direct Dyeing and Developed Colors

Product Samples and Prices on Request

SAMPLE CARDS

We Specialize

in the making of artistic sample swatch pages and folders.

Of the swatch pages appearing in the American Dyestuff Reporter, those handled by the Howes Publishing Company are prepared by us.

They are silent salesmen of the service we are equipped to offer textile and dyestuff manufacturers.

Color Cards Sample Cards
Pinking Mounting Printing Stamping
Binding Labelling Embossing

EXCELLENT SAMPLE CARD HOUSE Inc.
ALL KINDS OF SAMPLE CARDS
THREAD WINDING
SAMPLE CARDS OUR SPECIALTY

121 Prince Street New York

A Binder to Hold the Proceedings

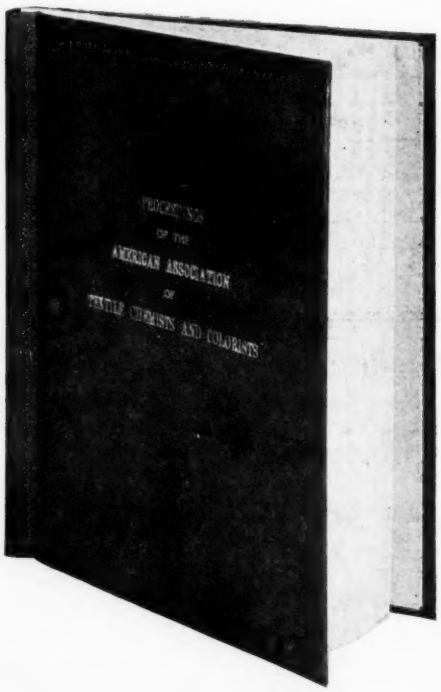
Bound in black cloth and leather, and stamped in gold. Strongly made, with a spring back that grips the pages tightly in a stiff pasteboard inner folder.

Can also be used for current copies of the Reporter; will hold eight issues.

Price, postpaid, $1.60

Address

Howes Publishing Company
90 William Street New York, N. Y.



UNITED CHEMICAL PRODUCTS CORPORATION

IMPORTERS, EXPORTERS AND MANUFACTURERS

YORK AND COLGATE STS., JERSEY CITY, N. J.

Manufacturers of

DIRECT FAST BLACK L

DIRECT FAST BLUE 4 G L

Also Announcing Our New Product

DIRECT FAST BLUE 2 G L

CHARLOTTE, N. C. ——BRANCHES—— PAWTUCKET, R. I.

THE DYER,

Calico Printer, Bleacher and Finisher.

The only Organ of these trades in Great Britain

43rd YEAR OF PUBLICATION

The Dyer has already a large circulation in the United States and throughout the American Continent.

Add the name of your firm to the list.

Published on the 1st and 15th of each month by

HEYWOOD AND COMPANY, Ltd., 150 Holborn, London, E. C. 1

Subscription 12/6 per annum, mail free.

HOWES PUBLISHING CO.,
90 William Street, New York.

.....192...

Please enter my subscription for the American Dyestuff Reporter for one year from date, for which you may bill me $5.00.

.....

.....

Canadian Postage $5.50: Foreign $6.00.

.....

Index to Advertisers Appearing in This Issue

Althouse Chemical Co.	XVI
American Aniline Products, Inc.	III
American British Chemical Supplies, Inc.	VII
American Dyewood Co.	IX
American Laundry Machinery Co.	XI
Arkansas Co.	VI
Arnold, Hoffman & Co.	—
Atlas Electric Devices Co.	IX
Bosson & Lane	IX
Calco Chemical Co.	—
Campbell, John, & Co.	VII
Ciba Co.	—
David, S. R., & Co.	—
Dunker & Perkins Co.	IV
Du Pont de Nemours, E. I., & Co.	XIII
Dye Products & Chemical Co.	—
Dyer & Calico Printer	XV
Excellent Sample Card House	XIV
Fleischmann Co.	—
Fletcher Works	—
Fortner, L. B., & Co.	—
Foster, Edward C.	XIV
Geigy Co., Inc.	Front Cover
Grasselli Dyestuff Corp.	IV
Hussong Dyeing Machine Co.	—
Innis, Speiden & Co.	VI
International Nickel Co.	—
International Salt Co.	—
Jennings & Co.	—
Klauder-Weldon Dyeing Machine Co.	X
Klipstein, A., & Co.	Second Cover
Lewis, John D.	—
Malt-Diastase Co.	VI
Metz, H. A., & Co.	V
National Aniline & Chemical Co.	XII
Newport Chemical Works	Back Cover
Roessler & Hasslacher	XI
Rohm & Haas Co.	X
Sandoz Chemical Works	—
Society of Dyers and Colourists	Third Cover
Tinc Tura Laboratories, Inc.	IV
Tolhurst Machine Works	X
United Aniline Co.	XVI
United Chemical Products, Inc.	XV
U. S. Color & Chemical Co.	VI
Wolf, Jacques, & Co.	—

QUALITY STANDARDS EXL DYES DYES

CAUSE *and* EFFECT

The quality of EXL dyes is topnotch because the materials that enter into their composition meet definite specifications of quality.

Definite quality is therefore a foregone conclusion.

The high standards of EXL dyes will be steadfastly maintained. This is a promise and a guarantee.

UNITED ANILINE COMPANY

Dyestuffs and Chemicals

120 High Street Boston

"EXL DYES EXL"

Althouse Specialized Colors

ALTCO BRAND Althouse Chemical Co. READING, PA.

Silk Brown R
[Reddish Cast]

Silk Brown G
[Greenish Cast]

Two extraordinary products directly appealing to Dyers of Silks, Woolens and Unions.

They excel in level dyeing qualities, affording, as well, highly desirable results when dyed in neutral or even slightly alkaline baths.

Both may be relied upon for a dependable fastness to all ordinary agencies.

May we submit samples?

Althouse Chemical Company
READING, PA.

NOW READY

COLOUR INDEX

in the English Language

Edited by

F. M. ROWE, D.Sc., F.I.C.

assisted by
C. LEA, M. Sc. Tech.
and
A Large Revision Committee of Experts

Size **12½"** x **9½"** **371** Folios (**742** Pages)

Bound in Full Leather **$28.00** Bound in Full Cloth **$25.00**

COLOUR USERS will find the "Alphabetical List" which sets out the various Makers of each Colour of the greatest use and assistance to them.

CONTENTS

SECTION A—Synthetic Organic Dyestuffs (291 folios).
SECTION B—Natural Organic Dyestuffs (10 folios).
SECTION C—Natural and Artificial Inorganic Colouring Matters (Mineral Pigments) (16 folios).
SECTION D—General Indices, Commercial Names, Patent Numbers, Intermediate Products, etc. (54 folios).

Commercial Names
Scientific Names
Components
Formula
Preparation
Discovery
Mode of Application
Literature
Description
Properties

of

Over 1300 Dyes

given, also a special column for purchaser's notes.

PUBLISHED AND ISSUED BY

The Society of Dyers and Colourists

PEARL ASSURANCE BUILDINGS, BRADFORD, YORKS., ENGLAND

For further particulars required apply THE SECRETARY

THE NEWPORT COLORS

Vat colors

Anthrene Golden Orange RRT Paste
Anthrene Golden Orange 4R Paste
Anthrene Golden Orange G Paste

These are our duplicates of imported types of the same designation.

Stocks ready for immediate shipment.

NEWPORT
TRADE MARK
"COAL TO DYESTUFF"

Newport Chemical Works, Inc.

Passaic, New Jersey

BRANCH OFFICES AND WAREHOUSES:
Boston, Mass.; Providence, R. I.; Philadelphia, Pa.; Chicago, Ill.; Greensboro, N. C.